

Meeting 24th Sep Wensum Ecology Working Group

Agenda

Previous Actions

General Update on project management

Widen Ecology Group membership. (Who How When)

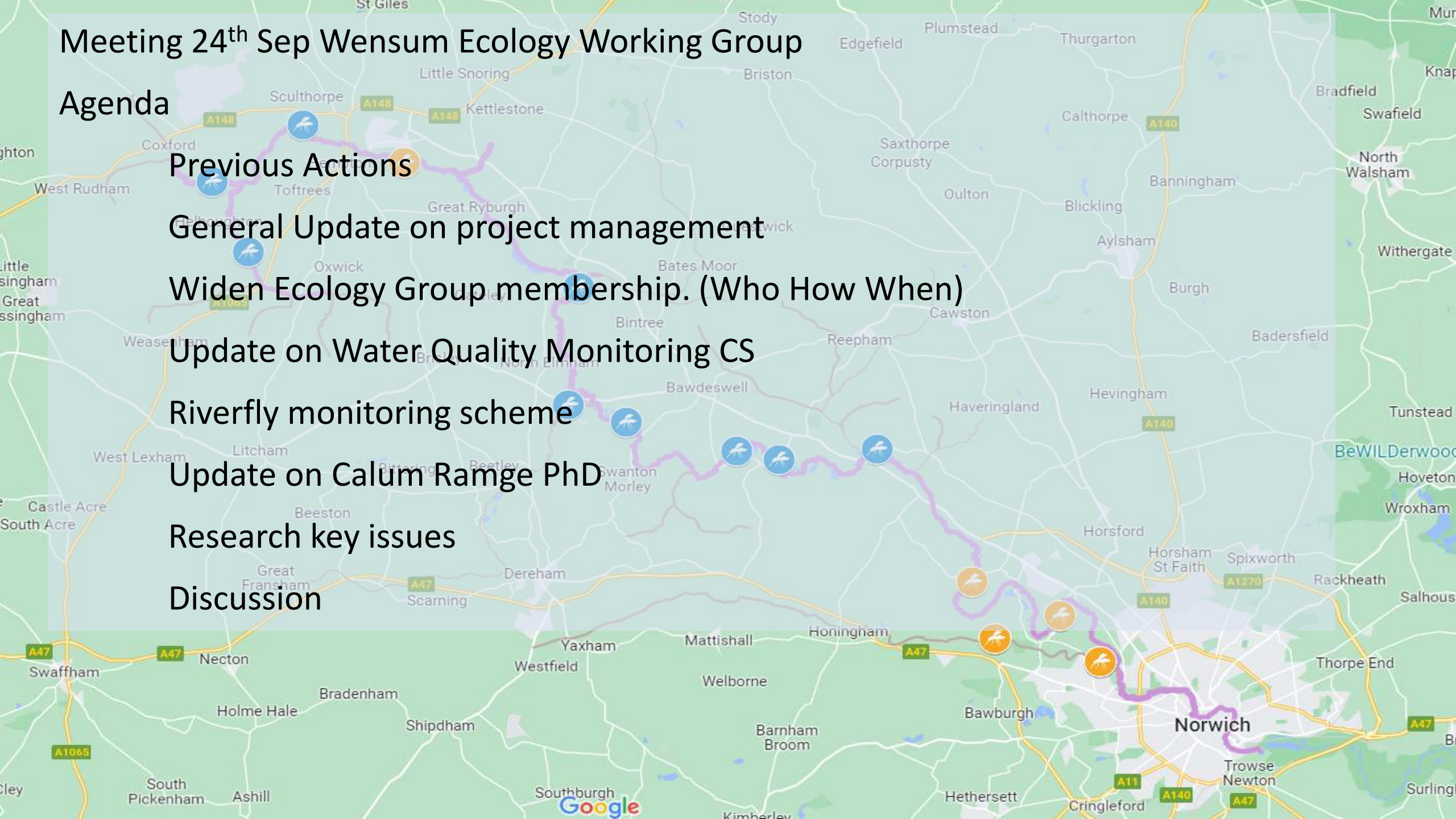
Update on Water Quality Monitoring CS

Riverfly monitoring scheme

Update on Calum Ramge PhD

Research key issues

Discussion



The East of England Catchments Hub

Ofwat, Defra, Environment Agency and the Environmental Audit Committee have provided clear direction to water companies to:

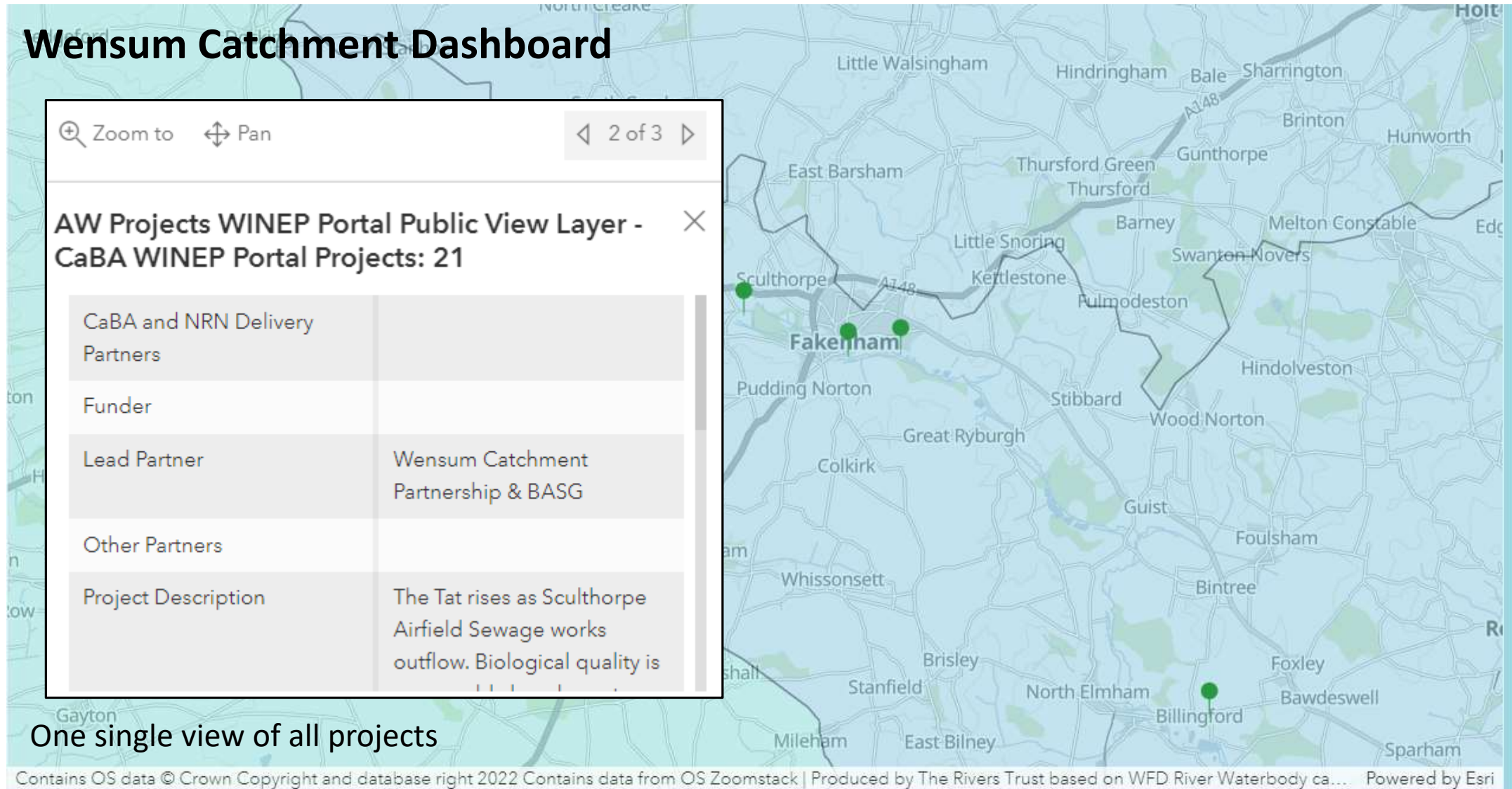
- Meet long-term challenges through increased collaboration and partnerships
- Support an increase in the use of catchment and nature-based solutions
- Place more emphasis on the value derived from natural capital and wider value for customers

Anglian Water and the Rivers Trust have established the East of England Catchments Hub to bring together local, regional and national expertise and resources that would:

- Support Catchment Partnership engagement
- Identify catchment schemes and nature-based solutions for WINEP for 2025-30
- Support catchment aspects of PR24 planning



Wensum Catchment Dashboard



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

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

14 Volunteers confirmed and equipped for the Headwaters.

3 Defined water blitz's planned for October, to define point sources.

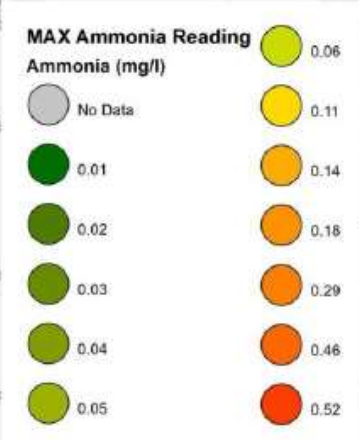
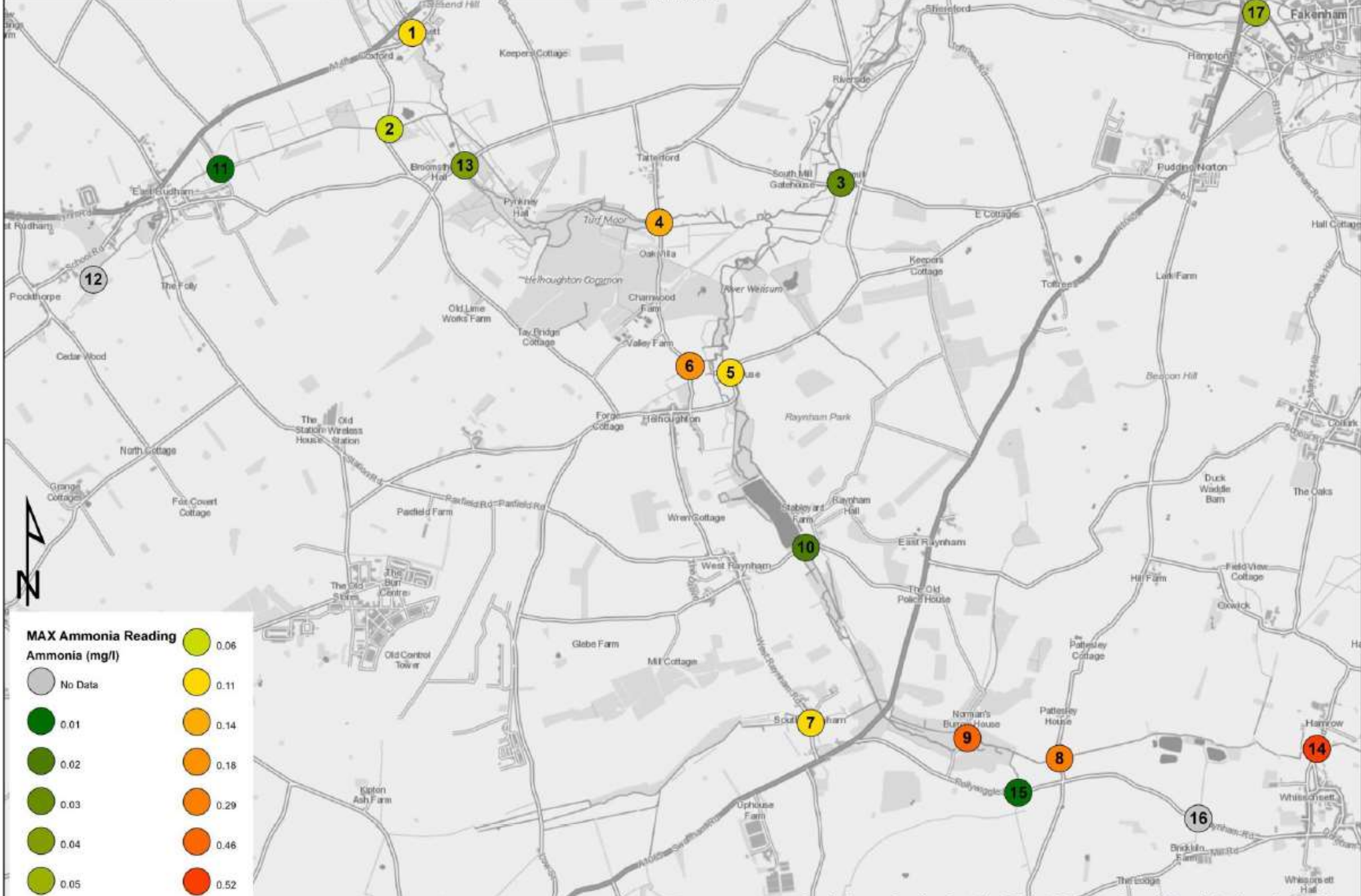
Wider 2023 emerging proposals through CASTCO, for the whole Wensum catchment.

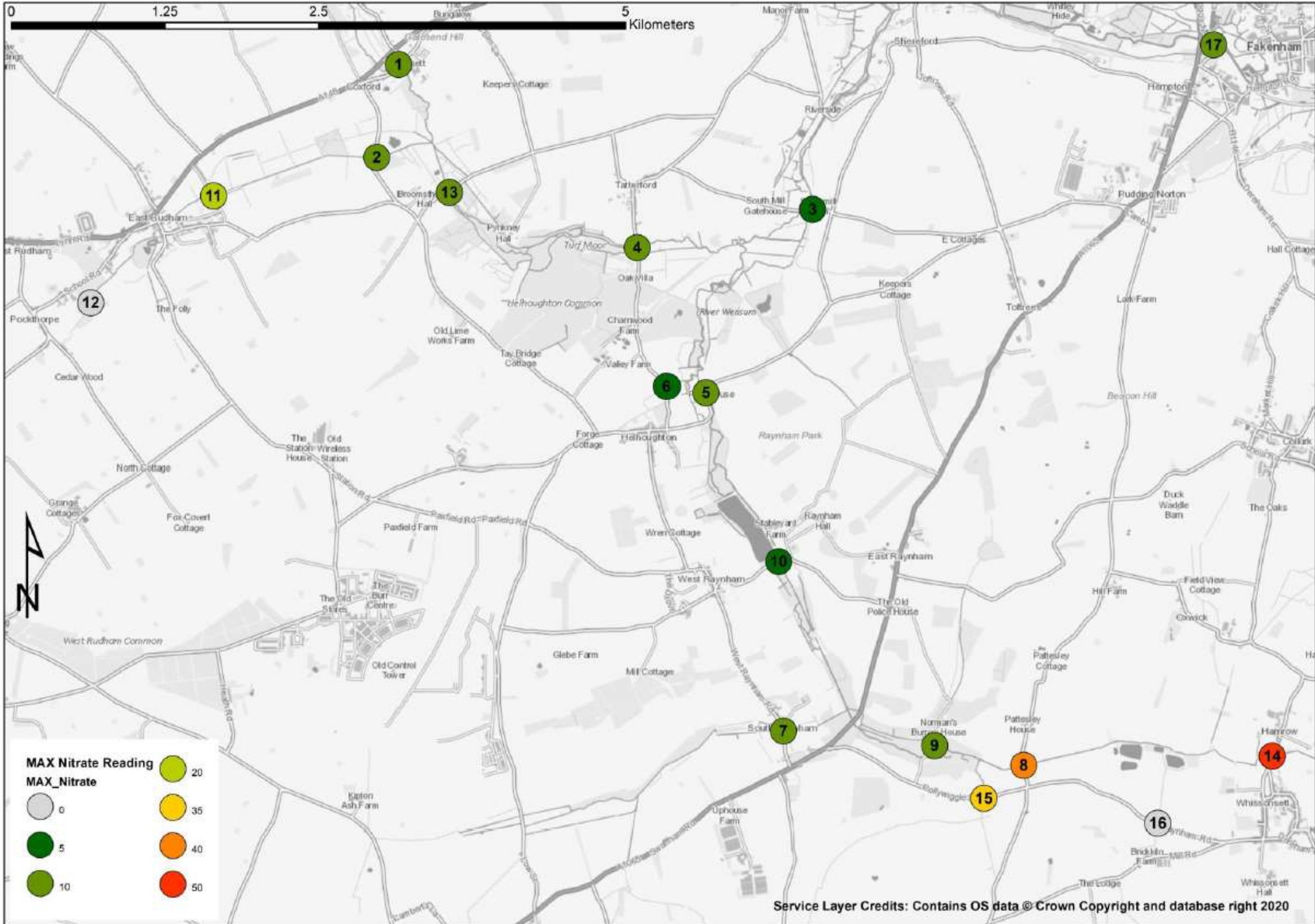
But our focus for 2022 are the headwaters.

Citizen Science: Water Quality Monitoring on the Wensum

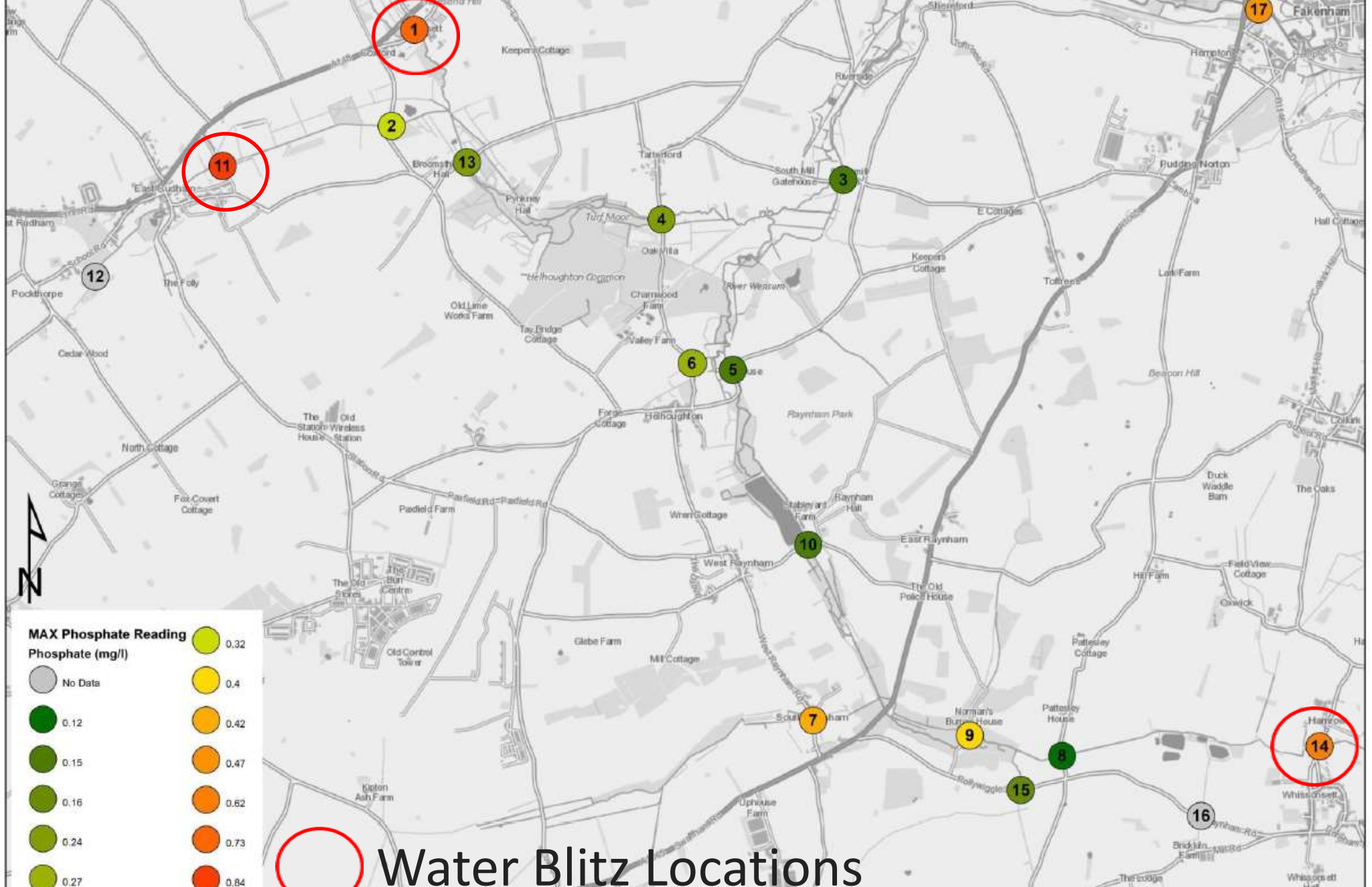


0 1.25 2.5 5 Kilometers





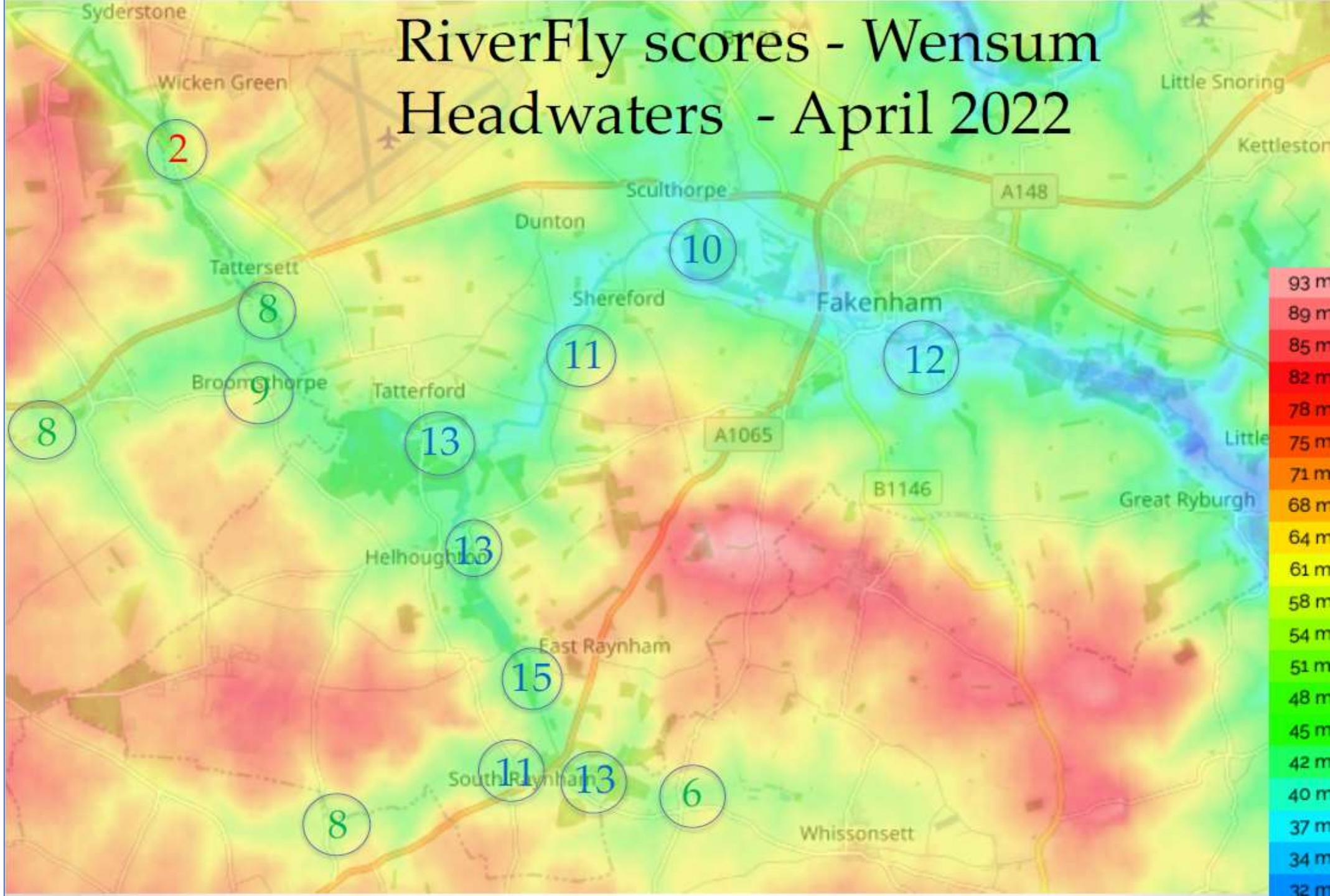
0 1.25 2.5 5 Kilometers



 Water Blitz Locations

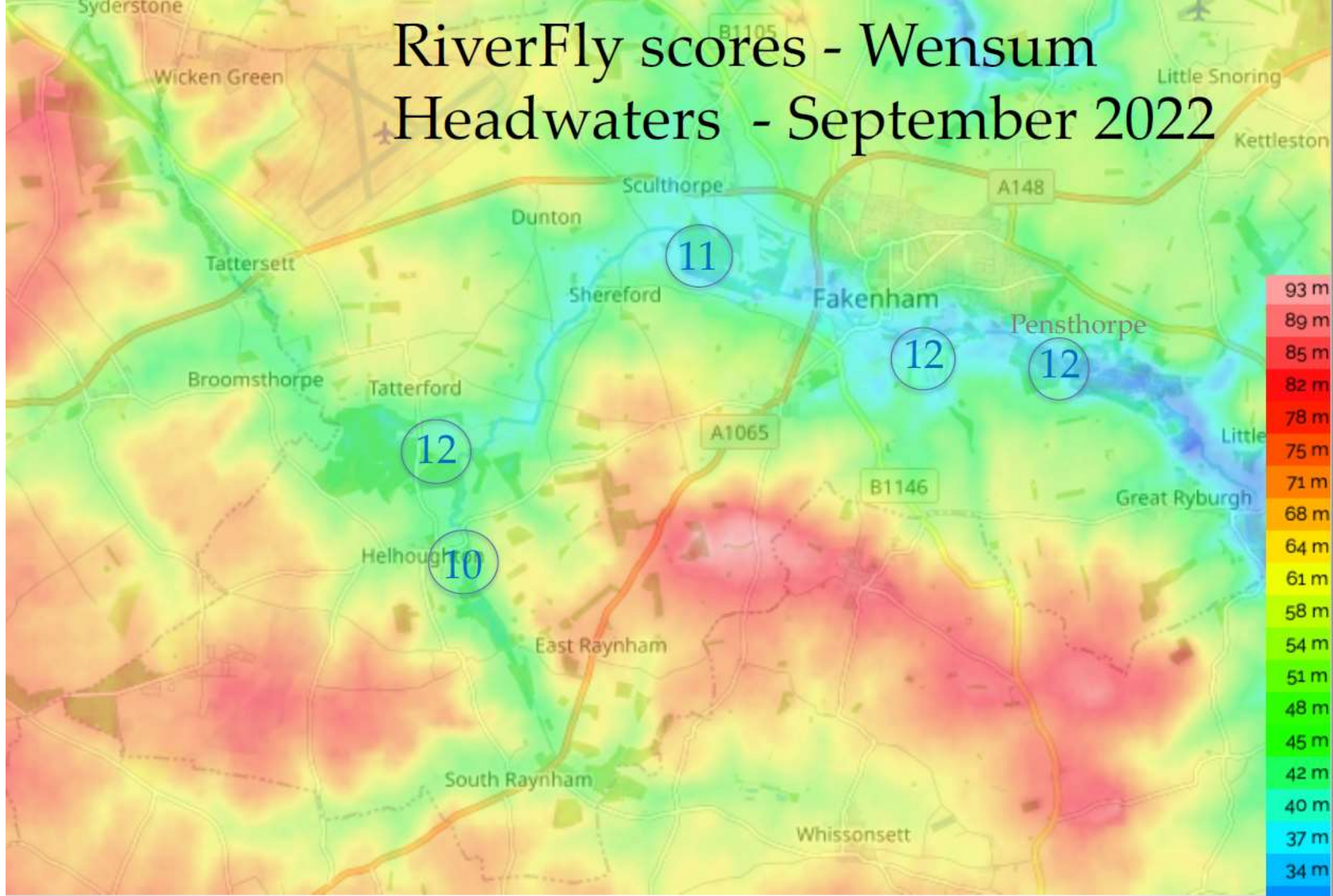
David Harper

RiverFly scores - Wensum Headwaters - April 2022



David Harper

RiverFly scores - Wensum Headwaters - September 2022



Wensum Headwaters Survey, April 2022

In conclusion,

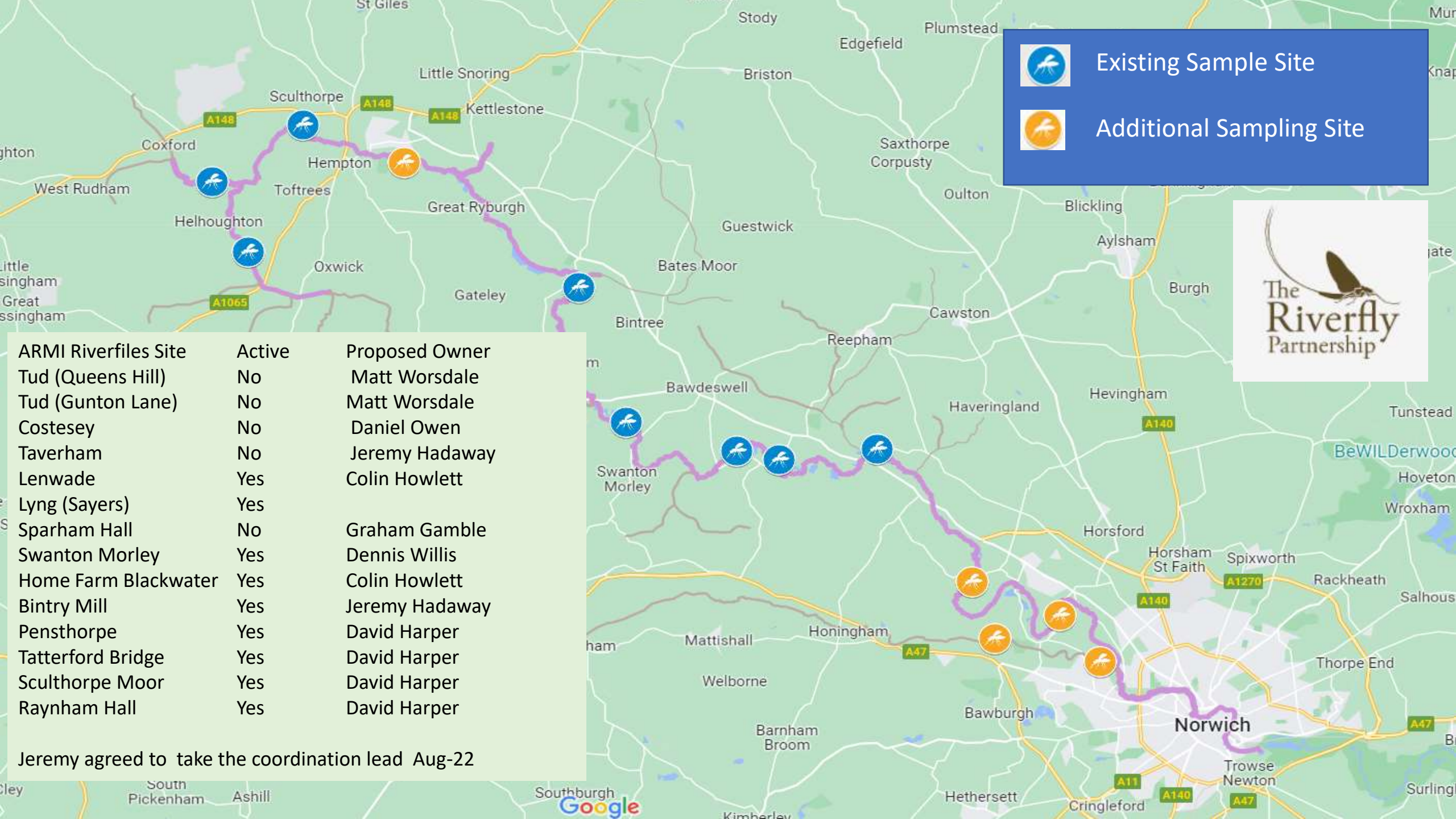
The Wensum Headwaters are in an extremely poor state, with limited improvement as downstream flow volume increases. This is largely due to poor physical state, a result of the ubiquitous engineering drainage works in the latter half of the 20th Century, and excessive silt deposits.



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



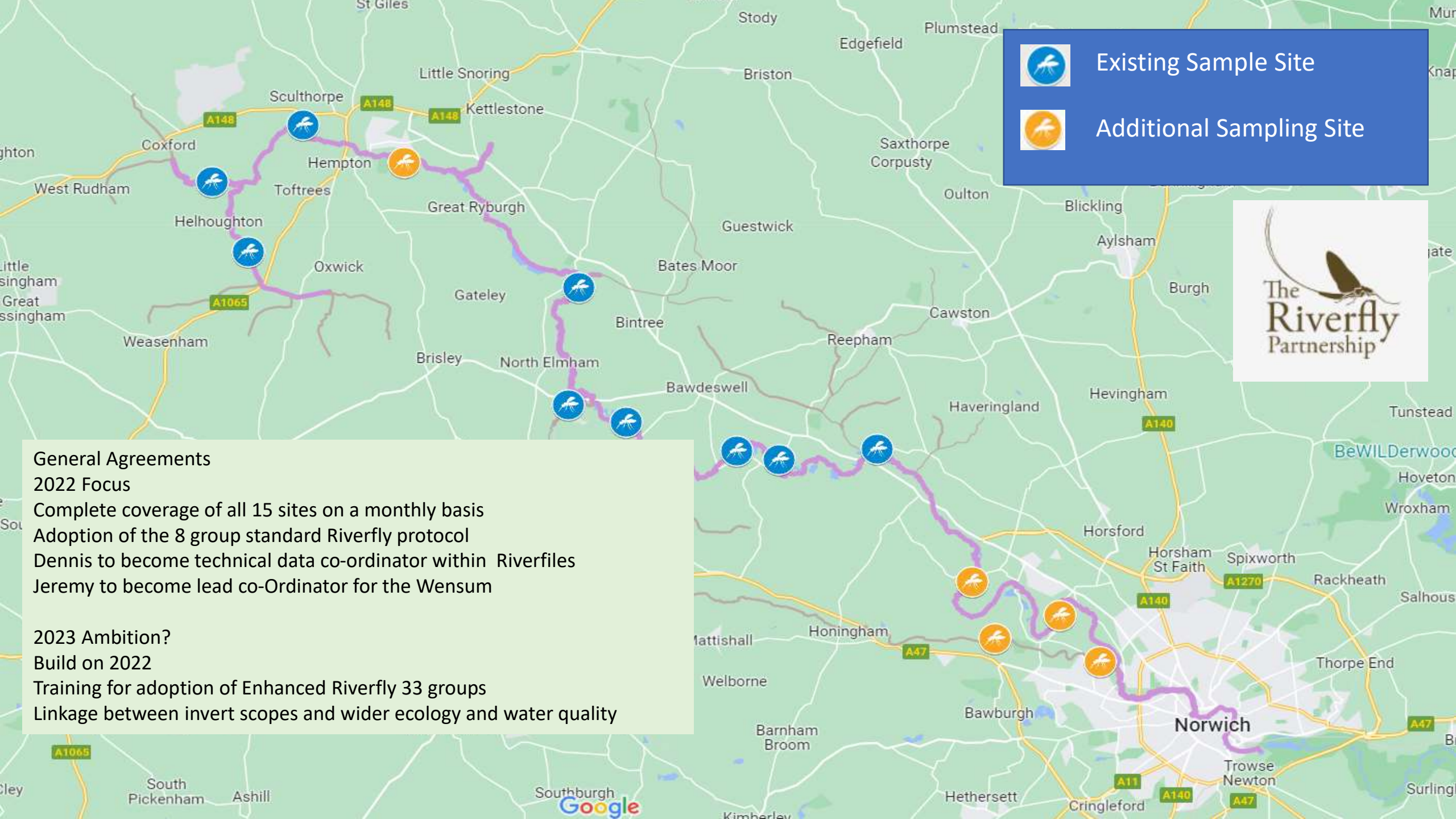




 Existing Sample Site
 Additional Sampling Site



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



-  Existing Sample Site
-  Additional Sampling Site



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

Calum Ramage PhD

Following review with our fish histopathologist last week to discuss her findings following the analysis of the River Wensum roach.

Fish were collected from three sites on the Wensum, and from a control site (the EA's Calverton fish farm).

A total of nine different tissues were analysed for histology in each fish (heart, ovaries, liver, kidney, hepatopancreas, spleen, gut, gills, and muscle).

There were definite differences between the three Wensum sites and between the control site, and some of these differences do suggest that Hellesdon Rd fish are most affected.

For example, liver lipidosis (i.e. the amount of fat stored in the liver) varied significantly between fish populations; while the control fish had normal fatty livers, fish at Hellesdon have virtually none.

This loss of lipids can occur as a direct response to intoxication, or as a secondary response following loss of body condition due to e.g. lack of food or stress.

She also pointed out that lipidosis seems to be inversely correlated to the number of hepatic parasites. Another parameter that seems quite interesting is the number of immature ovaries that were found in Wensum fish vs control; there was a distinct lack of gonadal differentiation, which again can be an indication of general poor doing.

Other parameters, including heart inflammation (reactive endocardium and epicarditis) and gill hyperplasia, also indicate some differences between sites.

Finally, she was quite surprised by the sheer number of parasites, particularly in the liver and kidneys.

Calum Ramage PhD (2)

Water and sediment samples.

The presence, quantity, and distribution of 65 current-use pesticides and 31 trace elements will be determined via UPLC-MS/MS and ICP-MS respectively. These are not yet processed, but scheduled for October.

Finally following John Findley help, the EA has expressed some interest.

John Clark will be collecting more samples of Roach from Hellesden for the National Fish Lab at Bampton.

There is also dialogue between Calum and the Bampton on the science.

River Tone sampling completed 2 weeks ago with zero issues.



Meeting 24th Sep Wensum Ecology Working Group

Biodiversity monitoring opportunities

How should we 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	Fish	Fish	Fish	Fish	Fish	Inverts	Chem P	Chem A	Chem N	Chem Solids	Flow	Fish Habitat	Fish Passage	Geomorphology	Macrophytes	NNIS	SAC	SAC	SAC
									Roach Density 100m2	Dace Density 100m2	Chub Density 100m2	Pike Density 100m2	Trout Density 100m2	Desg Density 100m3														
			Measure Definition					?	100m2	100m2	100m2	100m2	100m2	100m2														
1	N/A	N/A	Yare - New Mills	4.39																								
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 Mill	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 Langc	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

Meeting 24th Sep Wensum Ecology Working Group

Survey river and identify areas for improvement and shelf ready projects

Fakenham Hempall Road

Bintree Mill

Yarrow House

Mill House Farm

Blackwater Worthi

Billingsford Burgh C

Swanton Morely F

Sw Morely White

Mill Street Divert C

Lyng Mill and Kingf

Lyng Rectory Road

Lyng Sparham Poo

Lenwade Mill Lane

Lenwade A1067 Bridge

Attlebridge Church Farm

Wensum Drain at Penny Spot Beck

1000m 2021

1000m 2022

TF917529 / beside.picturing.octopus

TF996241 / dates.impeached.hairpin

TF990232 /

TG004203 /

TG002199 /

TG014193 /

TG020184 /

TG021805 /

TG050178 /

TG070178 /

TG072175 /

TG075175 /

TG101182 /

TG103182 /

TG129167 /

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