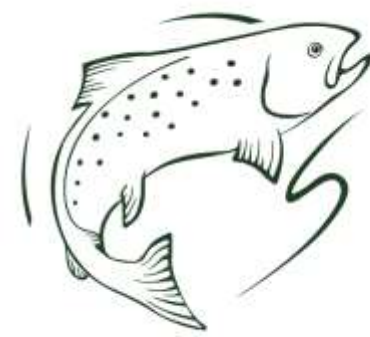




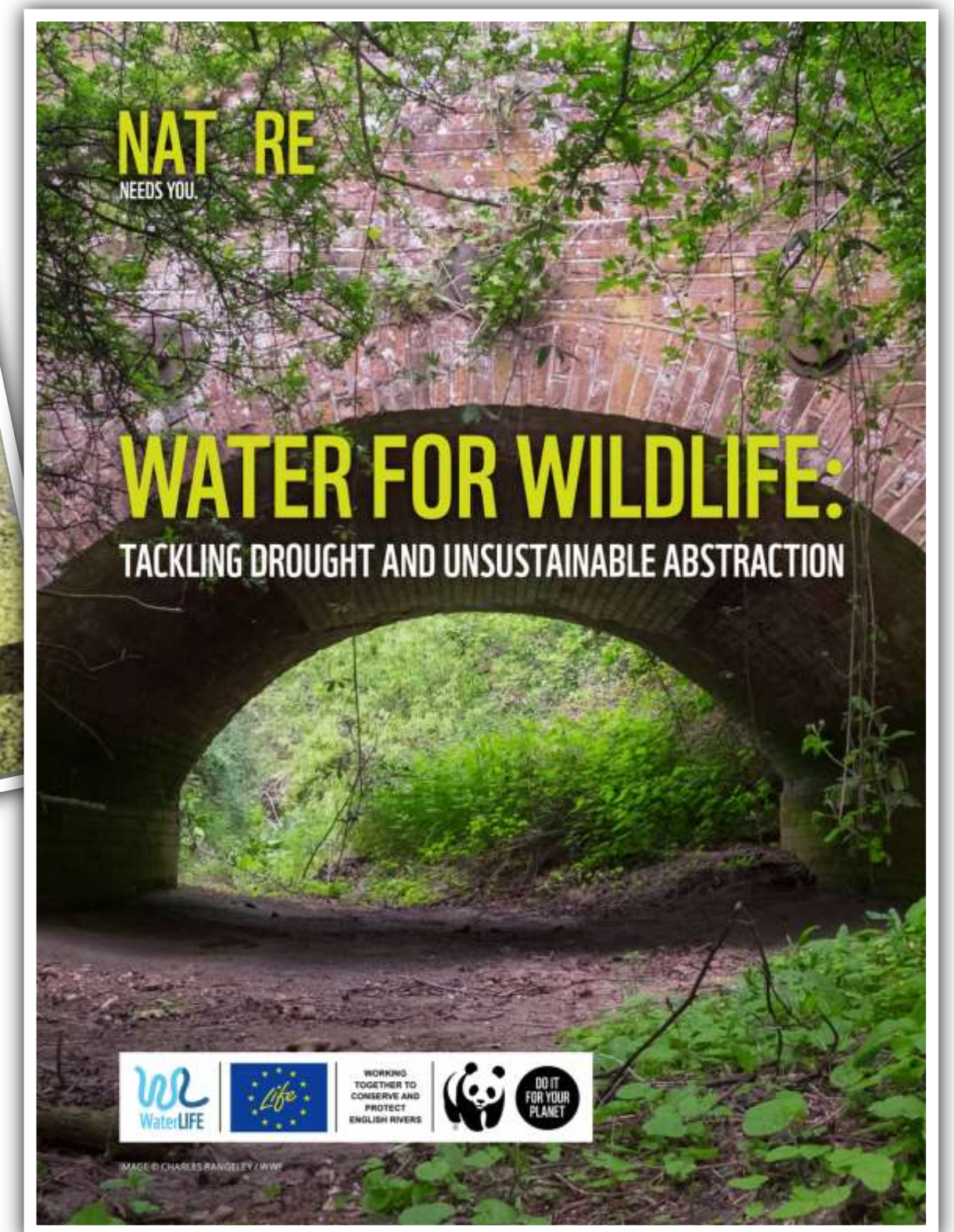
River Lark Flagship Catchment Restoration
Lessons from another East Anglian chalk stream



WILD TROUT TRUST



NORFOLK RIVERS TRUST





THE NORFOLK RIVERS TRUST
RESTORING NORFOLK'S RIVERS

THE RIVER NAR

A WATER FRAMEWORK DIRECTIVE LOCAL CATCHMENT PLAN



DEVELOPED IN PARTNERSHIP WITH



WORKING
TOGETHER
TO CONSERVE
AND PROTECT
ENGLISH
RIVERS



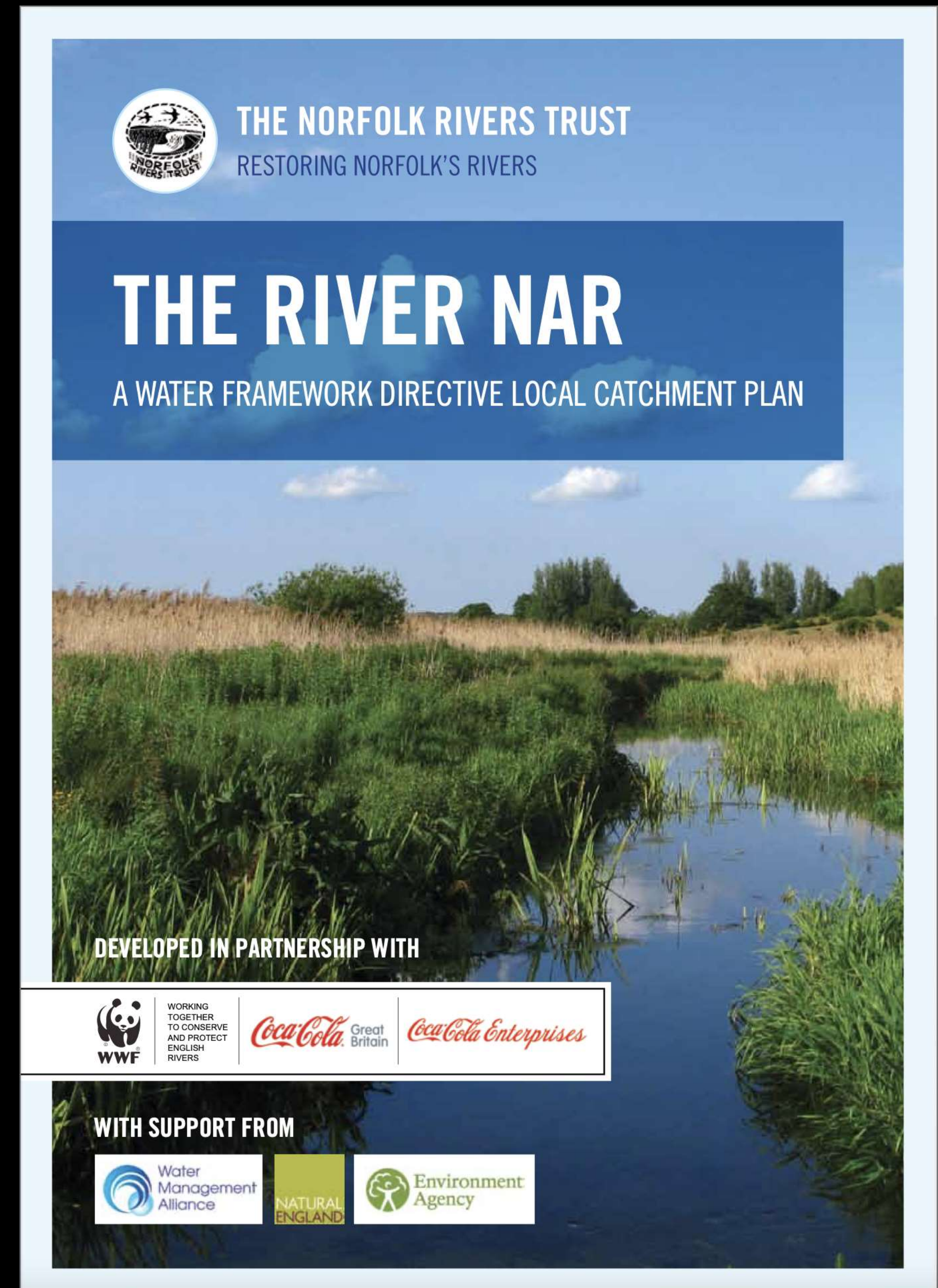
WITH SUPPORT FROM



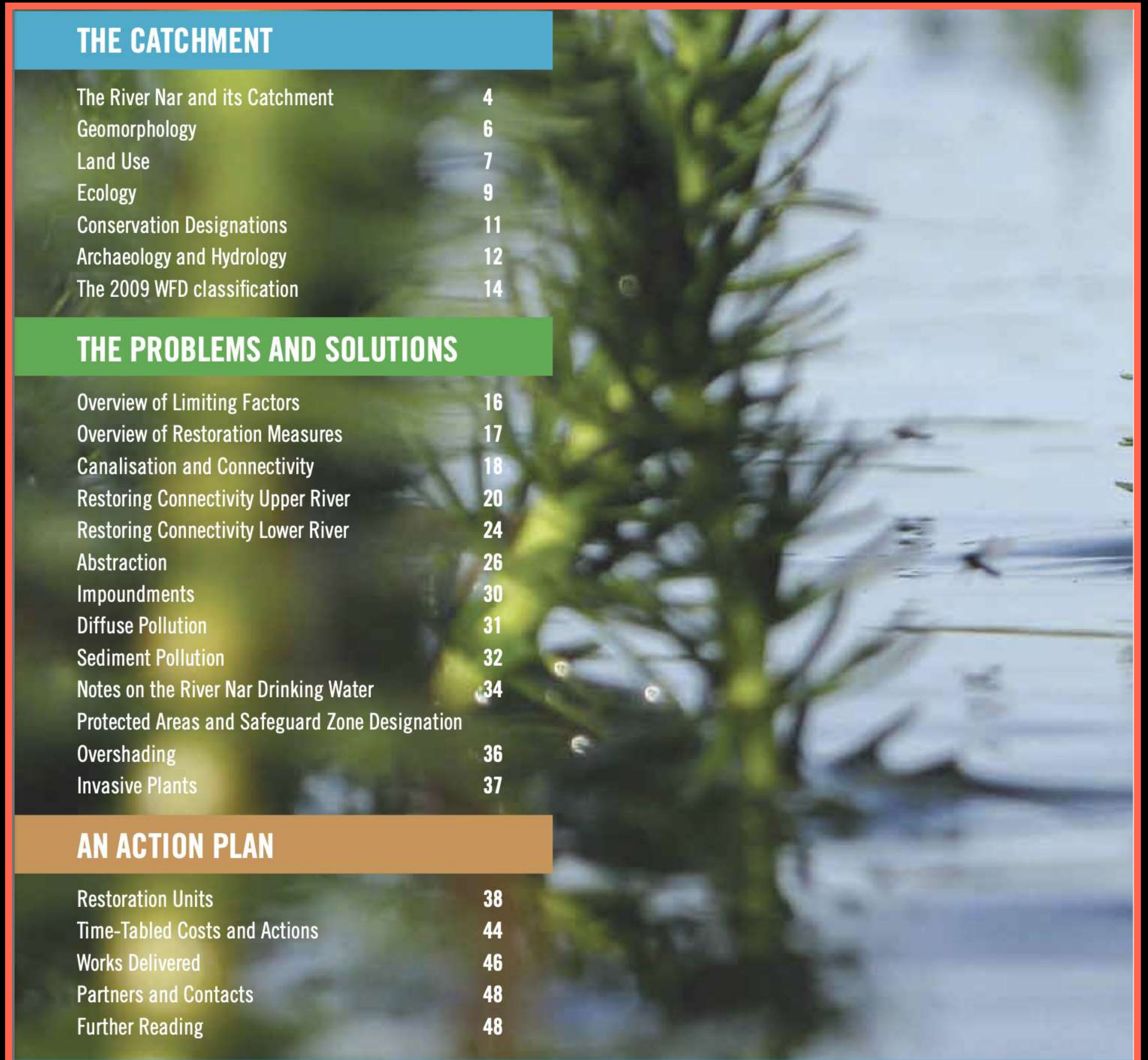
**Catchment
Based Approach**

**Chalk Stream Restoration Strategy 2021
Main Report**

- 2012 WWF sponsorship of Norfolk Rivers Trust included funding for an exemplar WFD catchment restoration strategy
- <https://norfolkriverstrust.org/wp-content/uploads/2019/02/River-Nar-local-catchment-plan-final-ver.pdf>
- Concise and accessible to the lay reader – a 30 minute read.
- Summarising problems, solutions, opportunities and costs

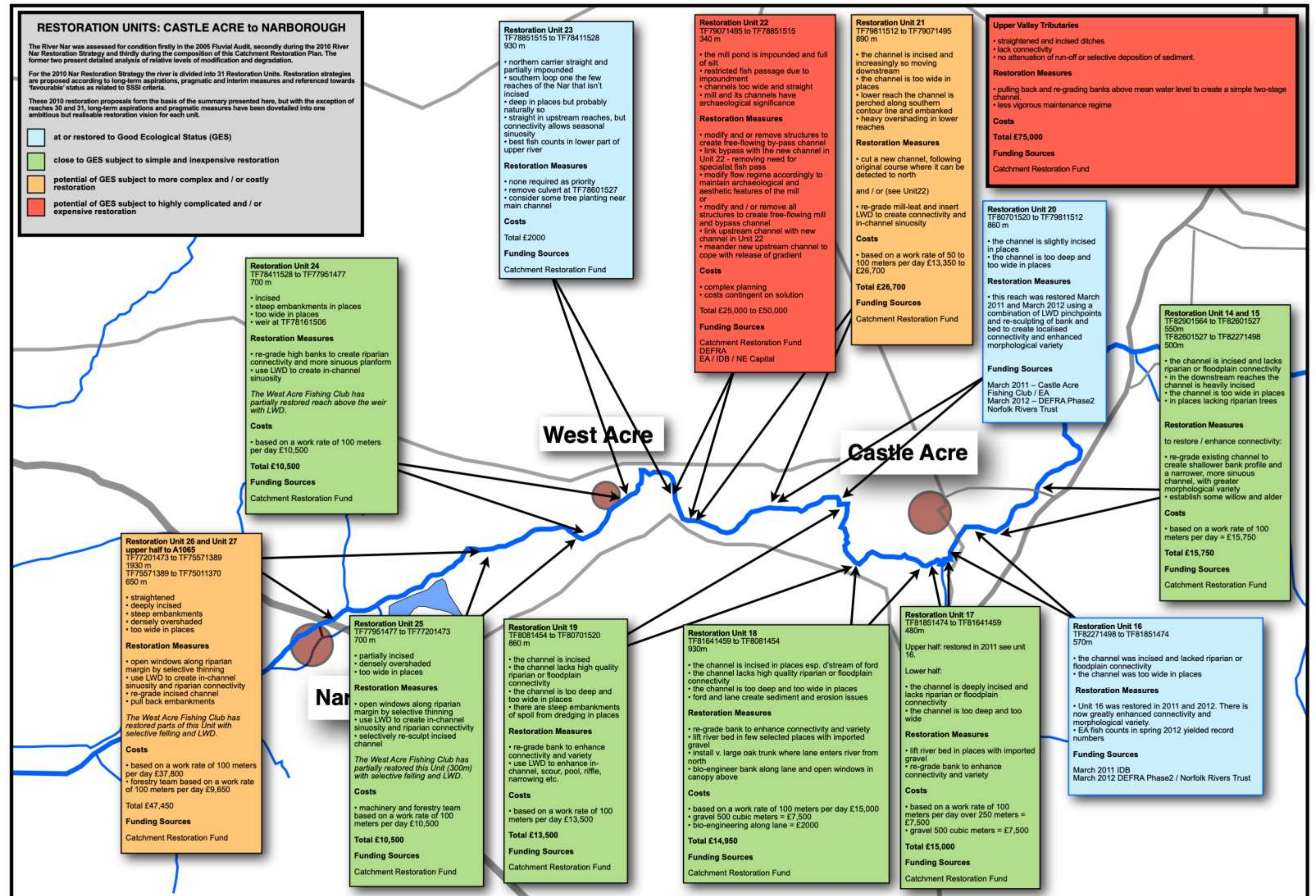


- Description of the catchment
- Analysis of the pressures and problems
- Water quantity: abstraction pressures
- Water quality: diffuse pollution, sediment and sewage
- Physical habitat quality: canalisation, dredging, impoundments, lateral connectivity, invasive species
- Overview of restoration measures
- Analysis of the drivers for restoration and funding



THE CATCHMENT	
The River Nar and its Catchment	4
Geomorphology	6
Land Use	7
Ecology	9
Conservation Designations	11
Archaeology and Hydrology	12
The 2009 WFD classification	14
THE PROBLEMS AND SOLUTIONS	
Overview of Limiting Factors	16
Overview of Restoration Measures	17
Canalisation and Connectivity	18
Restoring Connectivity Upper River	20
Restoring Connectivity Lower River	24
Abstraction	26
Impoundments	30
Diffuse Pollution	31
Sediment Pollution	32
Notes on the River Nar Drinking Water	34
Protected Areas and Safeguard Zone Designation	
Overshading	36
Invasive Plants	37
AN ACTION PLAN	
Restoration Units	38
Time-Tabled Costs and Actions	44
Works Delivered	46
Partners and Contacts	48
Further Reading	48

- Identification of 'reference' reaches
- Reach-by-reach breakdown of physical condition
- Traffic-light grading system
- Summary of measures to restore each reach to good ecological status, together with cost estimates
- Aim: to elevate the greatest linear length of the stream to GES / NE "favourable condition" as quickly and cost-effectively as poss.



Costed time-line

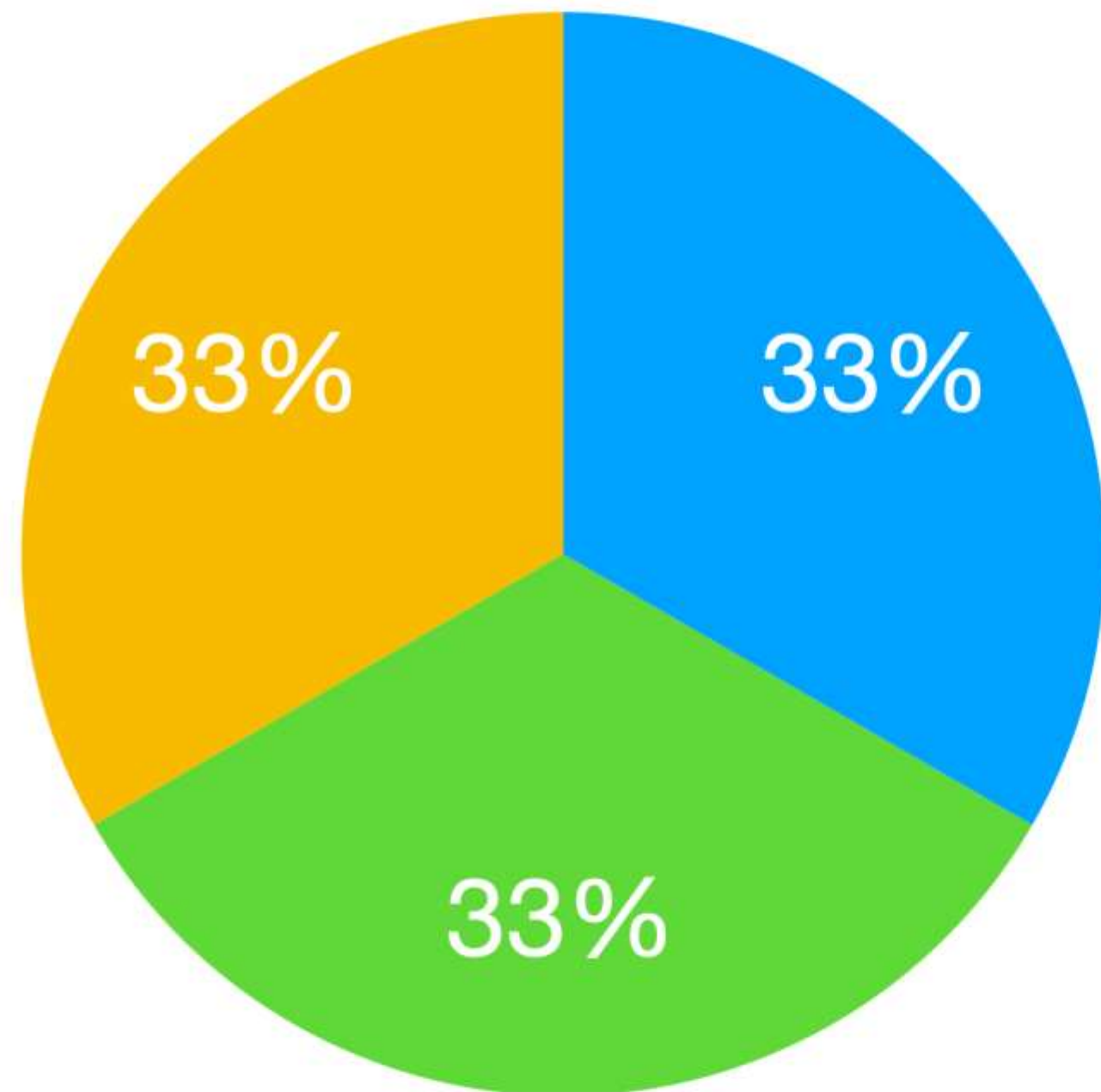
RESTORATION UNIT	COST	FUNDING SOURCE	STATUS 2012	STATUS 2015	STATUS 2021	STATUS 2027
Unit 1.	£23,250 + £16,000 capital WWF	CRF / WWF (Mileham)	Stage 1.			
Units 2 and 3.	£34,500 + £15,000 monitoring + £16,000 capital WWF	WWF (Mileham)	Stage 1.			
Unit 4.	£13,800	CRF / DEFRA / EA / IDB / NE	Stage 2. complex due to bridge and village			
Unit 5.	£18,900	CRF (Mileham +)	Stage 1. re-grading of existing project			
Unit 6.	£15,000	CRF / DEFRA / EA / IDB / NE	Stage 1. complex due to lakes but high priority to remove barrier			
Unit 7.	£8,850	CRF (Mileham +)	Stage 1.			
Unit 8.	£31,200 to £50,000	CRF / DEFRA / EA / IDB / NE	Stage 2. complex due to bridge, village, reservoir and steep embankments			
Unit 9.	£16,950	CRF (Mileham +)	Stage 1.			
Unit 10.	£21,750 to £41,400	CRF / DEFRA / EA / IDB / NE	Stage 1. complex due to lakes but high priority to remove barrier			
Unit 11.	£20,850	CRF / DEFRA / EA / IDB / NE	Stage 1.			
Units 12 and 13.	£24,000	CRF / DEFRA / EA / IDB / NE	Stage 1.			
Units 14 and 15.	£15,750	CRF / DEFRA / EA / IDB / NE	Stage 1.			
Unit 16.			delivered			
Unit 17.	£15,000	CRF / DEFRA / EA / IDB / NE	Stage 1.			
Unit 18.	£14,950	CRF / DEFRA / EA / IDB / NE	Stage 1.			
Unit 19.	£13,500	CRF / DEFRA / EA / IDB / NE	Stage 1.			
Unit 20.			delivered			
Unit 21.	£26,700	CRF (West Acre)	Stage 1.			
Unit 22.	£25,000 to £50,000	CRF / DEFRA / EA / IDB / NE	Stage 2. complex due to mill but high priority to remove barrier			
Unit 23.						
Unit 24.	£10,500	CRF (West Acre)	Stage 1.			
Unit 25.	£10,500	CRF (West Acre)	Stage 1.			
Unit 26 / 27 (upper).	£47,450	CRF (West Acre)	Stage 1.			
Unit 27 (lower).	£50,000 to £300,000 (EA estimate)	CRF / DEFRA / EA / IDB / NE	Stage 2. complex due to impoundments but high priority to remove barrier			
Unit 28.	£0 to 2015 + £300,000 for the flume by-pass (latest EA figure) / £83,400 to 2021	CRF / DEFRA / EA / NE	Stage 2. Re-grading			
Unit 29.	£0 to 2015 / £78,300 to 2021	CRF / DEFRA / EA / NE	Stage 2. Re-grading			
Unit 29a.	£25,000	CRF / DEFRA / EA / NE	Stage 2. highly complex due to bridge and impoundment but high priority to remove barrier			
Unit 30 (upper)	£82,500 - £100,000	CRF (Pentney)	Stage 1. weed-management + restoration: complex due to land take required			
Unit 30 (lower)	£0 to 2015 / £95,000 - £380,000 to 2027	CRF / DEFRA / EA / NE	Stage 3. Re-grading			
Unit 31.	£0 to 2015 / £200,000 - £800,000 to 2027	CRF / DEFRA / EA / NE	Stage 3. Re-grading			
SEDIMENT to WETLAND	£300,000	CRF				
	£ = Stage 1 CRF bid £ = Stage 1 unsecured £ = Stages 2 and 3 unsecured			£1,067,900 to £1,087,550	£145,000 to £438,800	£295,000 to £1,280,000



CORE POLLEN ANALYSIS - RIVER STIFFKEY FLOODPLAIN - WARHAM 2022

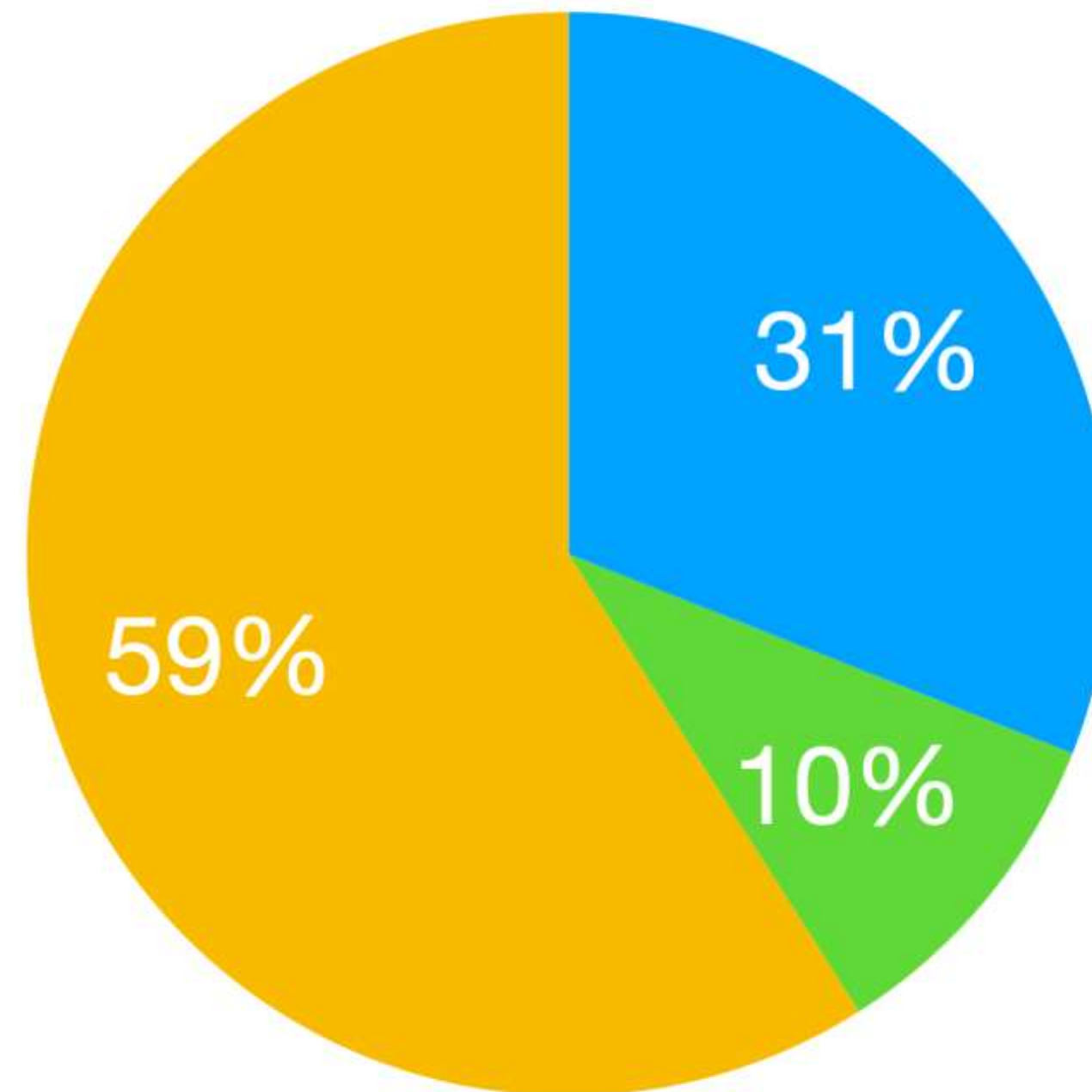
● AQUATICS ● WOODLAND ● HERBS & GRASSES

EARLY MESOLITHIC
6000 BC



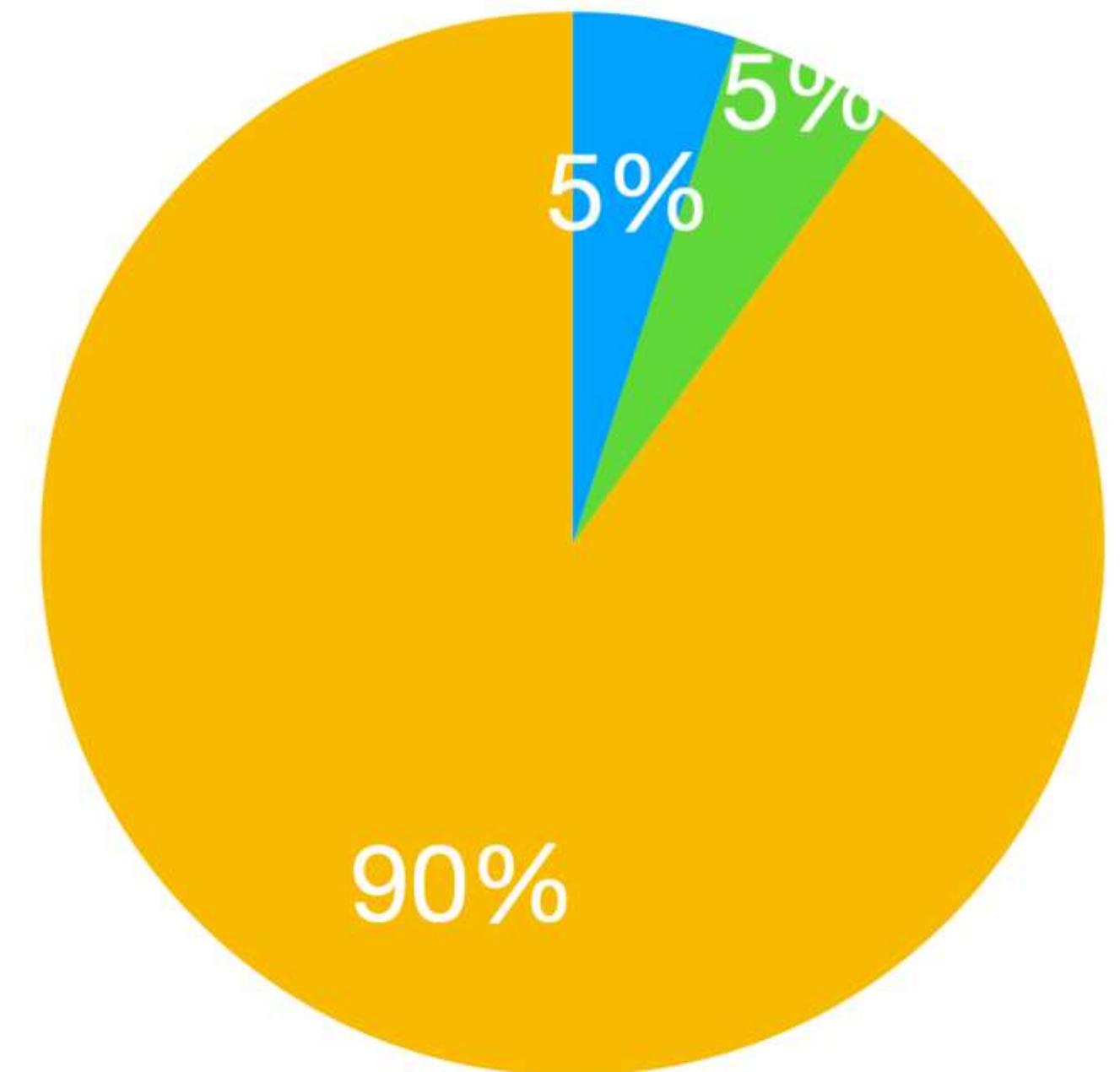
DIVERSITY 0.90

ROMANO-BRITISH
0 BC



DIVERSITY 0.73

PRESENT DAY
2022



DIVERSITY 0.31



HOW WE GO FROM 0.31 ...



... BACK TOWARDS 0.91



April 2012

Turning green reaches
blue



April 2014



May 2020





Turning amber reaches blue





April 2015



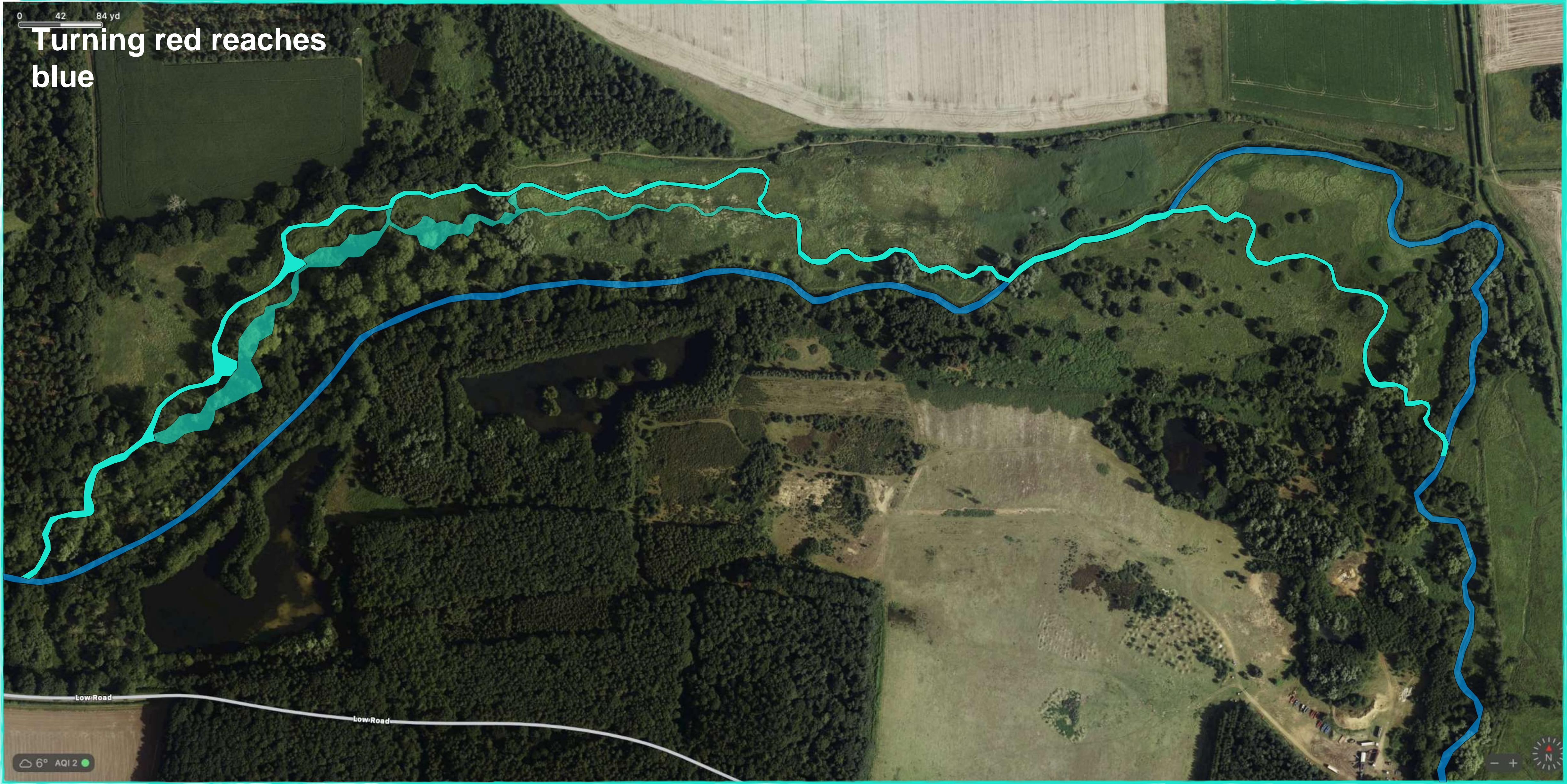
December 2015



December 2019

0 42 84 yd

Turning red reaches
blue

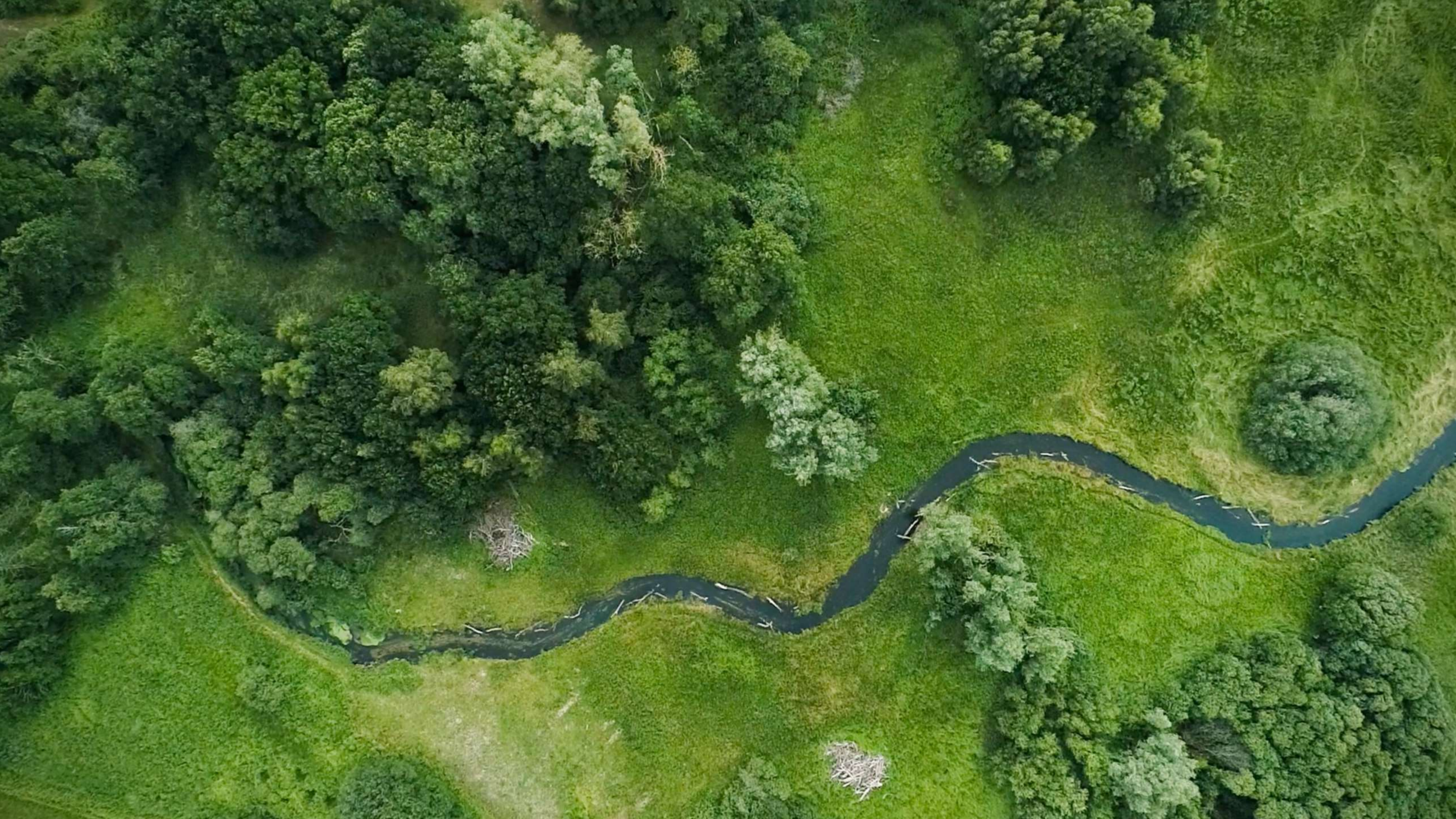


Low Road

Low Road

6° AQI 2







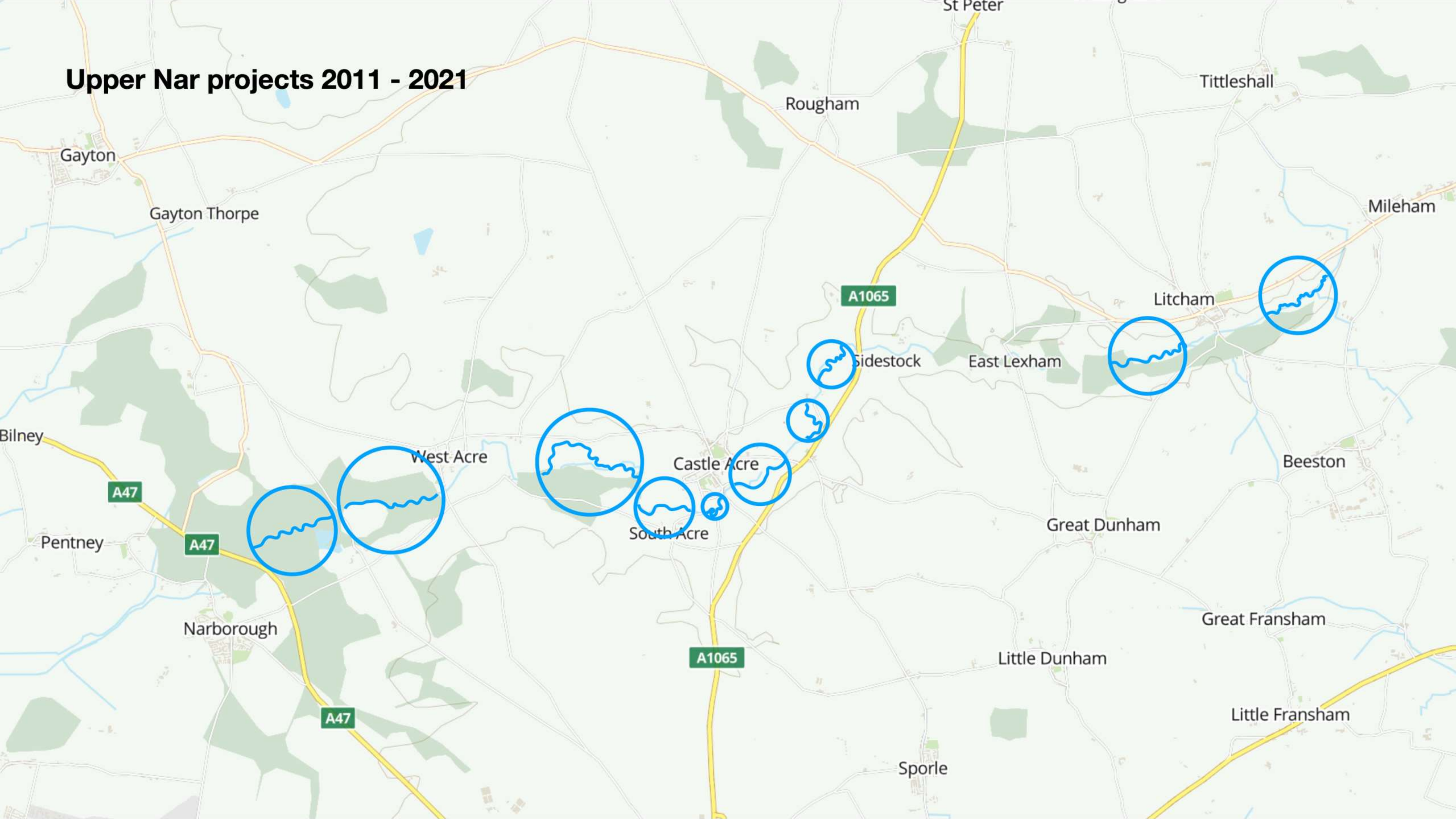
Sept 2019



July 2021



Upper Nar projects 2011 - 2021





**Catchment
Based Approach
Chalk Stream Restoration Strategy 2021**

What is the CaBA chalk stream restoration strategy?

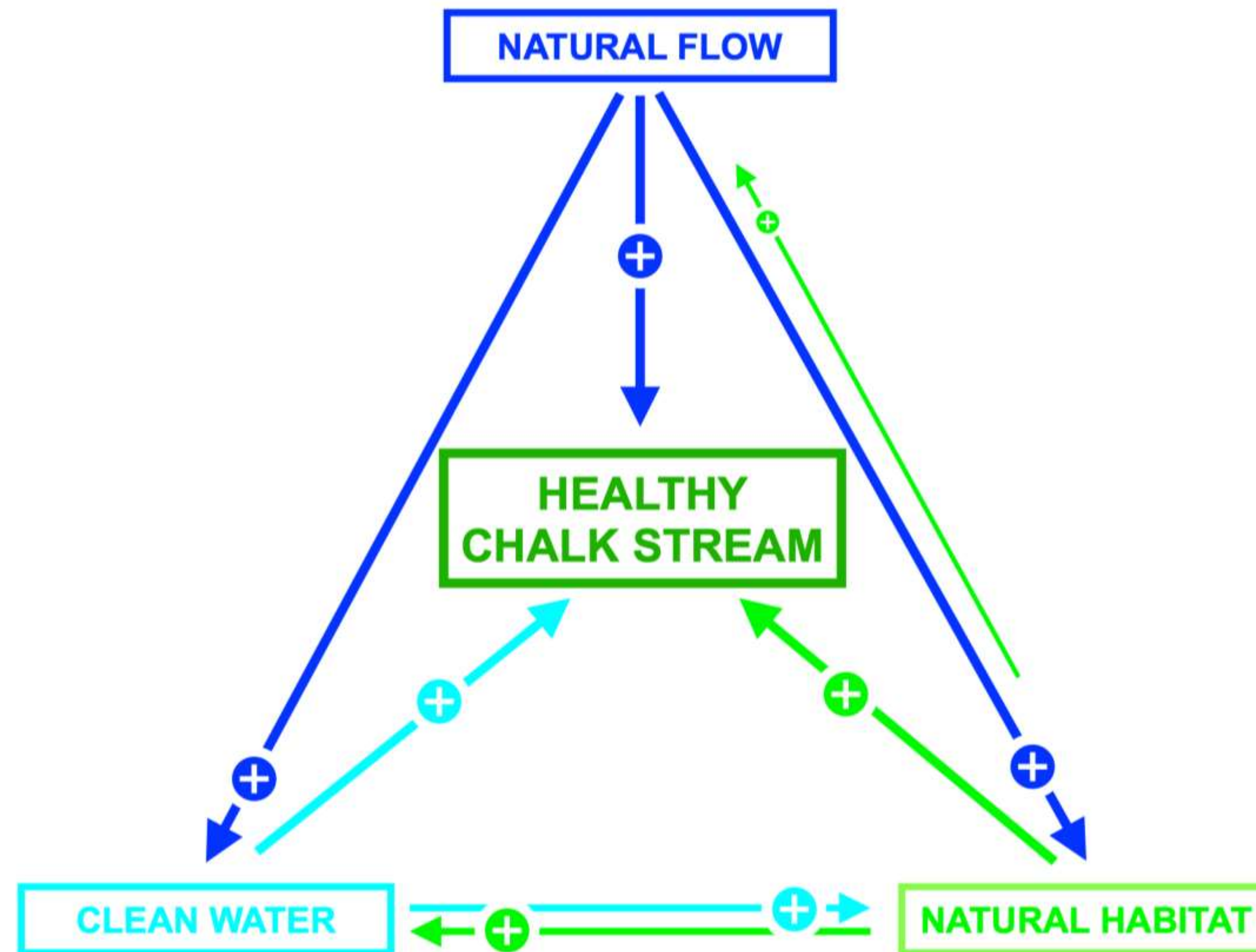
"A plan, strategy and set of recommendations for how to restore good ecological health to the unique chalk streams of England and to the landscapes which support them."

It represents a collaborative approach between regulators, industry, NGO's and independent stakeholders.

independent stakeholders,
industry, NGO's and
approach between regulators,
it represents a collaborative



How the strategy is structured:



Gains in any one component will benefit the other two, but the greatest gains and best value are achieved by addressing all three components together.

30 + recommendations to Defra, the Environment Agency, Natural England, the water companies, NGOs and stakeholders.

Covering:

- **time-bound goals for achieving sustainable abstraction / re-naturalising flows**
- **review WFD assessment points and waterbody boundaries to better protect chalk streams, especially their headwaters**
- **all water resource supply regions dependent on chalk aquifers now defined as “water stressed” enabling the roll out of universal metering**
- **an independent review of abstraction as a % of recharge to map the spatial distribution and intensity of abstraction pressure on chalk streams**
- **Chalk Streams First: a “flagship flow recovery project”**

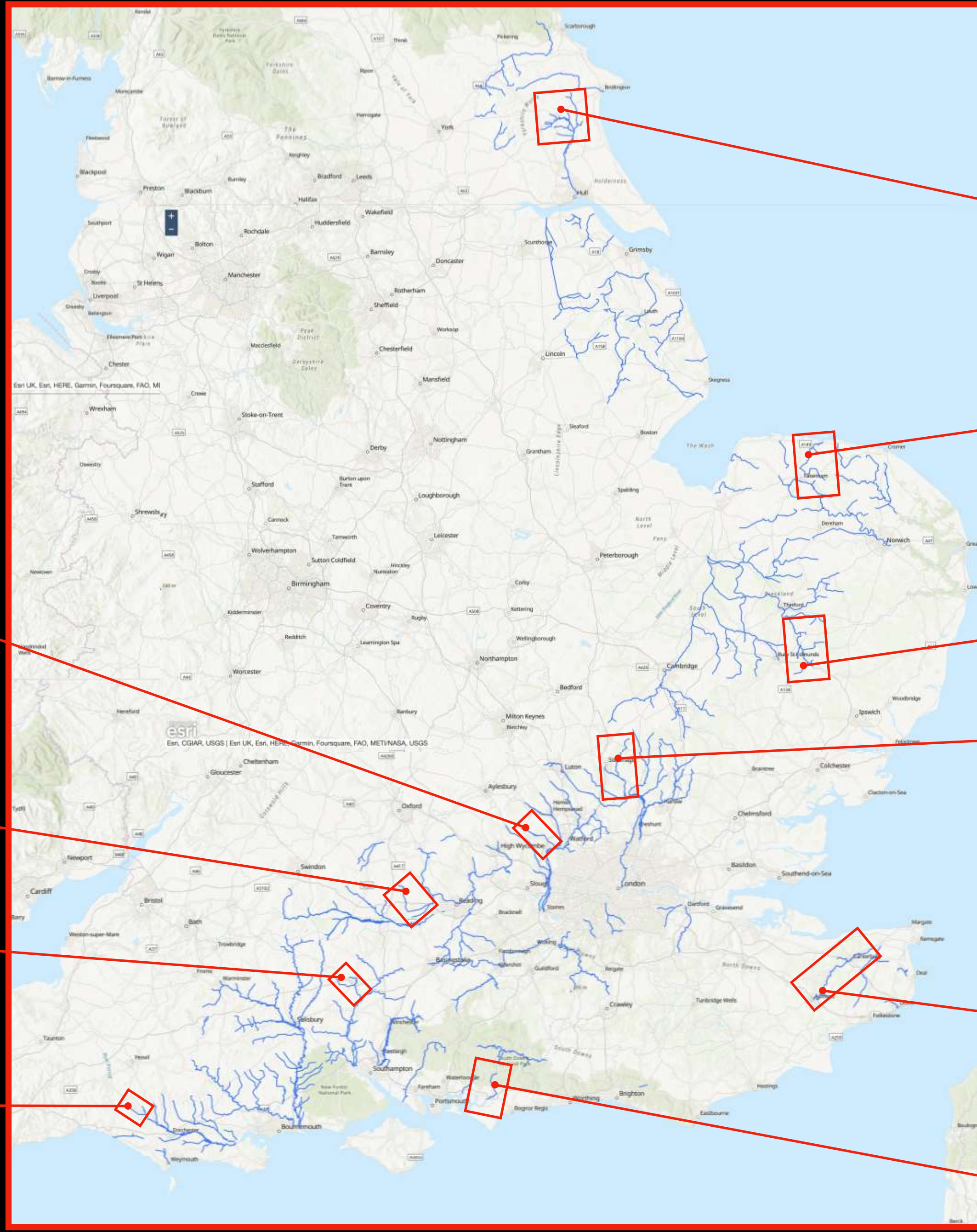
- **defining chalk streams as "high priority sites" in the Storm Overflows Reduction Plan:**
- **prioritisation for chalk streams in the national framework for water resources and water company water resource management plans**
- **upgraded sewage treatment and integrated wetlands to address impact of small STWs in headwaters**
- **farming rules for chalk streams**
- **knowledge sharing, open data, information hubs**
- **physical habitat restoration**
- **Water Resources Chalk Partnership Fund: £1 million funding available annually to partnership projects in chalk catchments**



And because we can't do everything all at once on all chalk streams we recommend ...

... a national network of flagship catchment restoration projects to:

- develop and demonstrating the art of the possible
- inspire others
- show what river restoration can achieve
- make the case for the application of the strategy on all chalk streams



Yorkshire Water - The Hull Headwaters

Anglian Water - The River Stiffkey

Anglian Water - The River Lark

Affinity Water - The River Beane

Thames Water & Affinity Water - The River Chess

Thames Water - The River Pang

Southern Water - The River Anton

South East Water - The Great Stour

Wessex Water - The Frome headwaters

Portsmouth Water - The River Ems

"One Big Wish" for chalk streams

The central recommendation in the strategy is for greater protection and an economic lever which would:

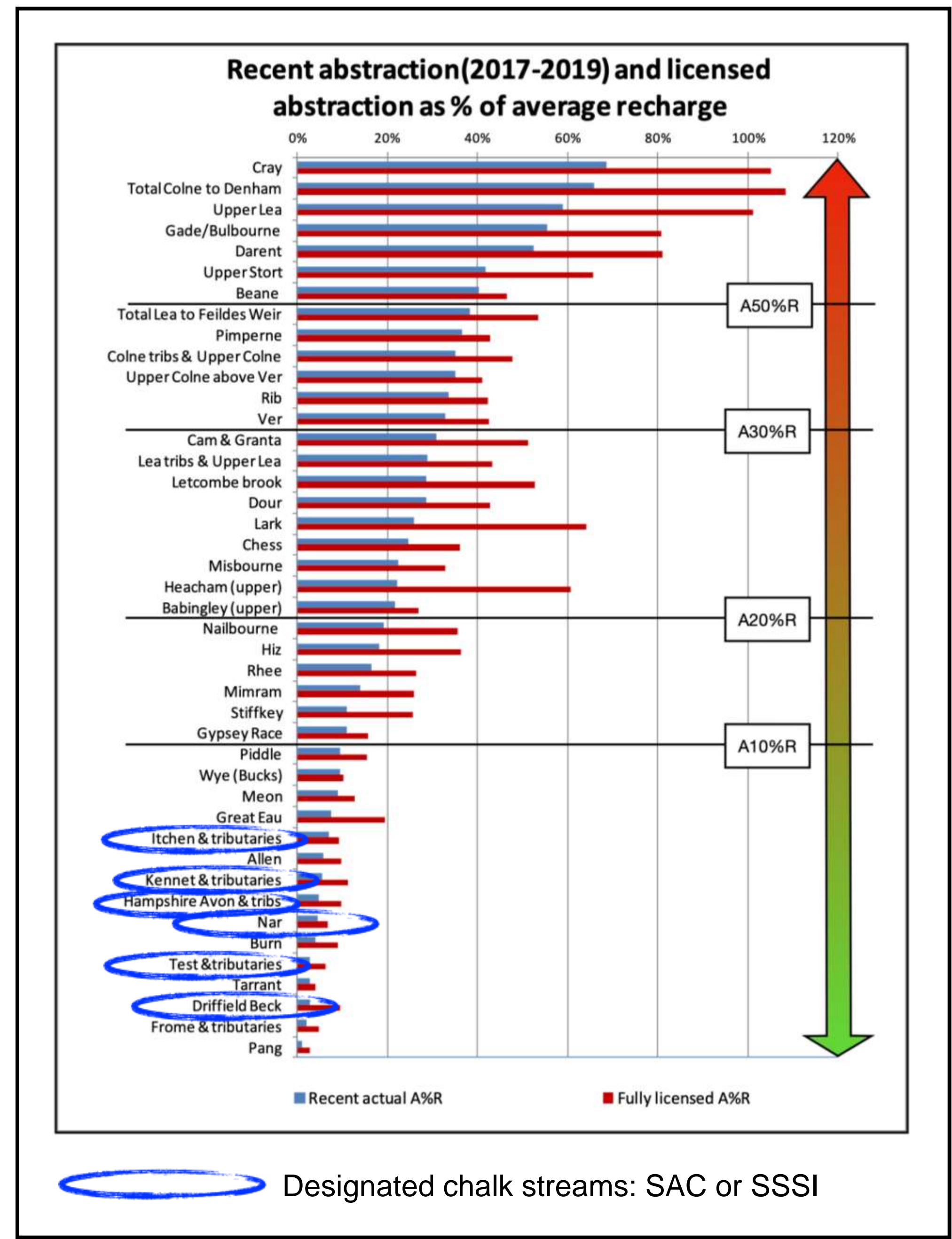
- take the brakes off investment in the cost-benefit analysis process
- release funding from schemes such as landscape recovery, local nature recovery, biodiversity net-gain etc.



On June 15th Minister Pow announced that a Defra Chalk Stream Recovery Package will be developed and published by the end of 2023



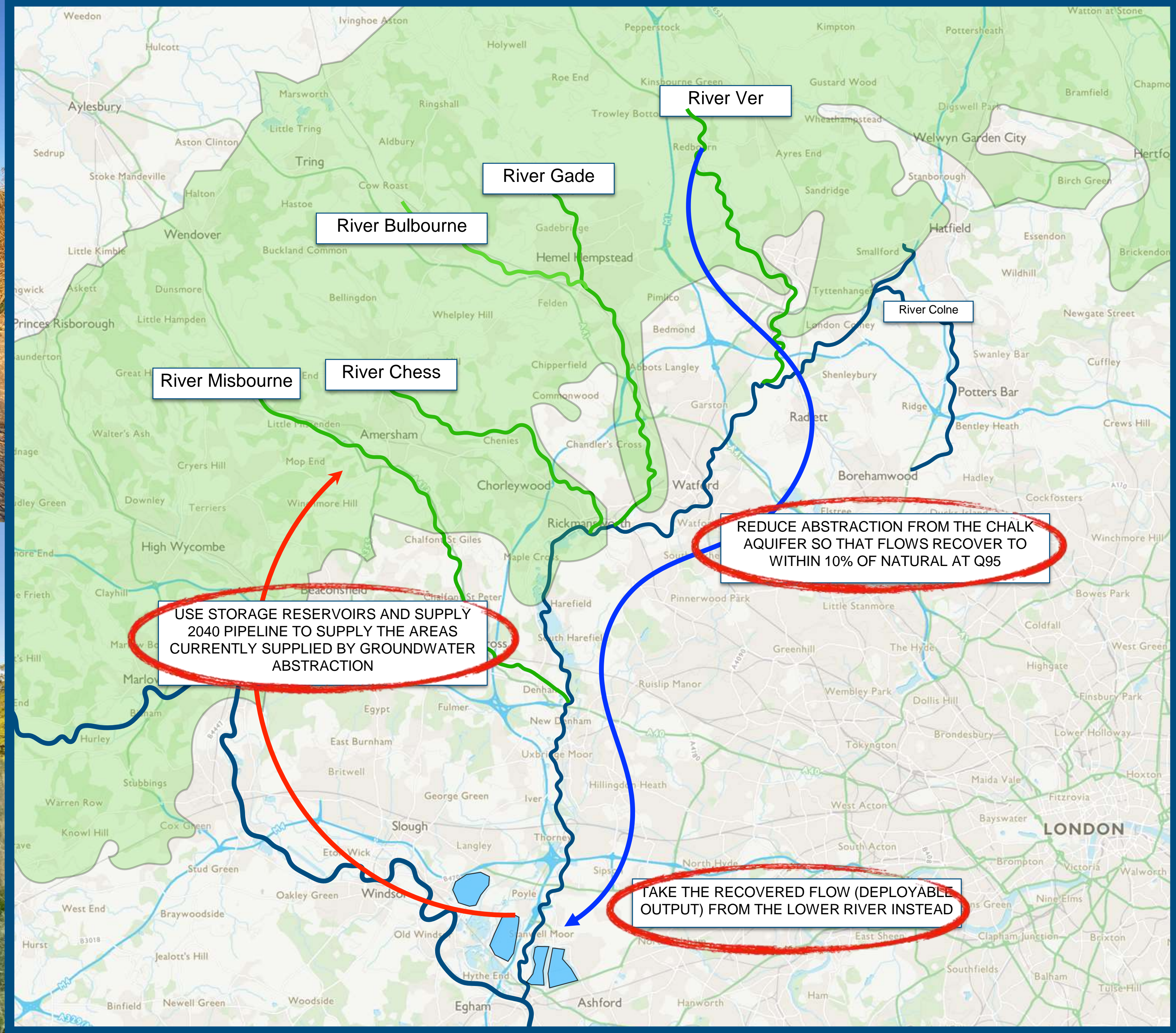
The River Lea: A60%R

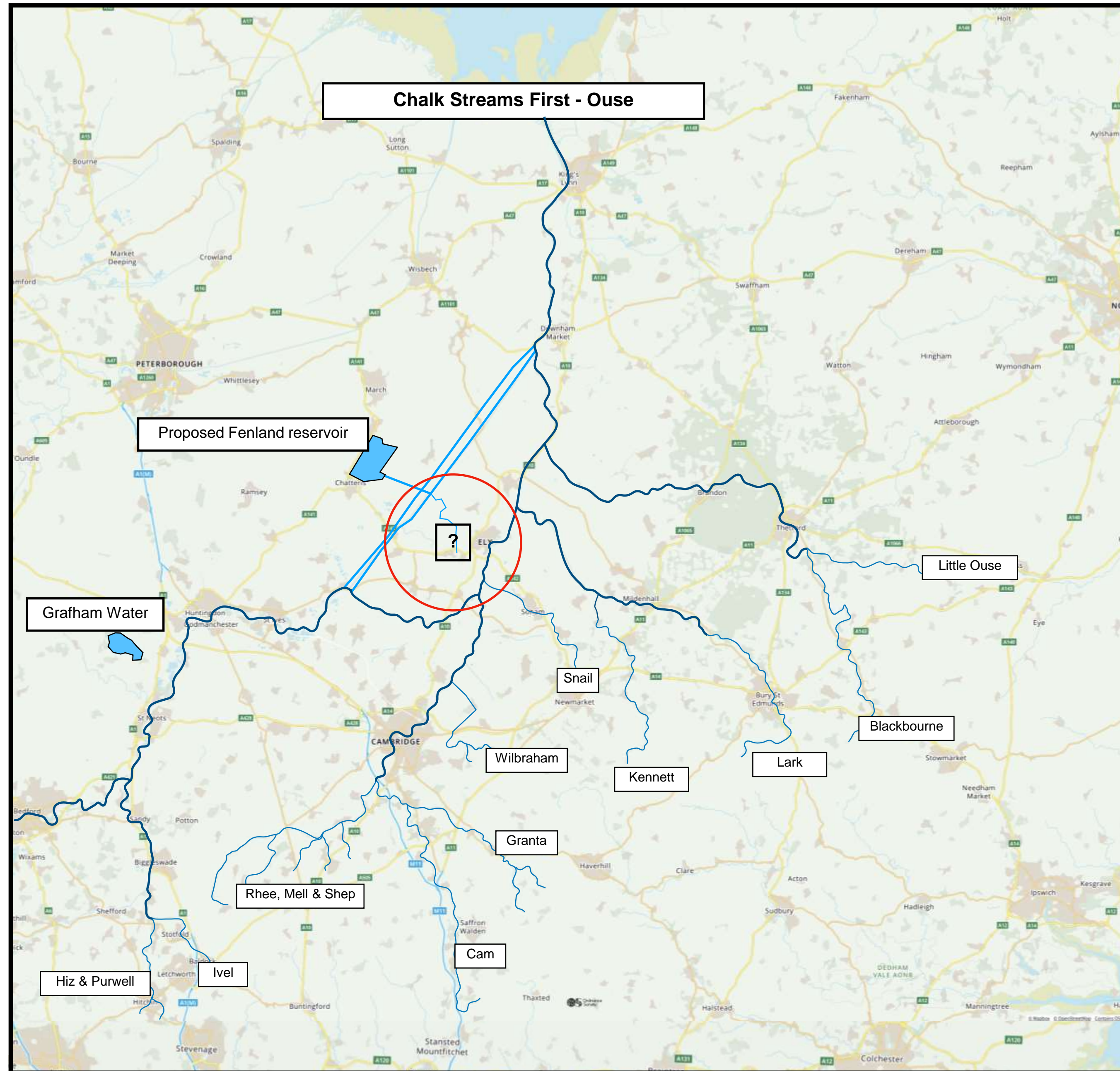


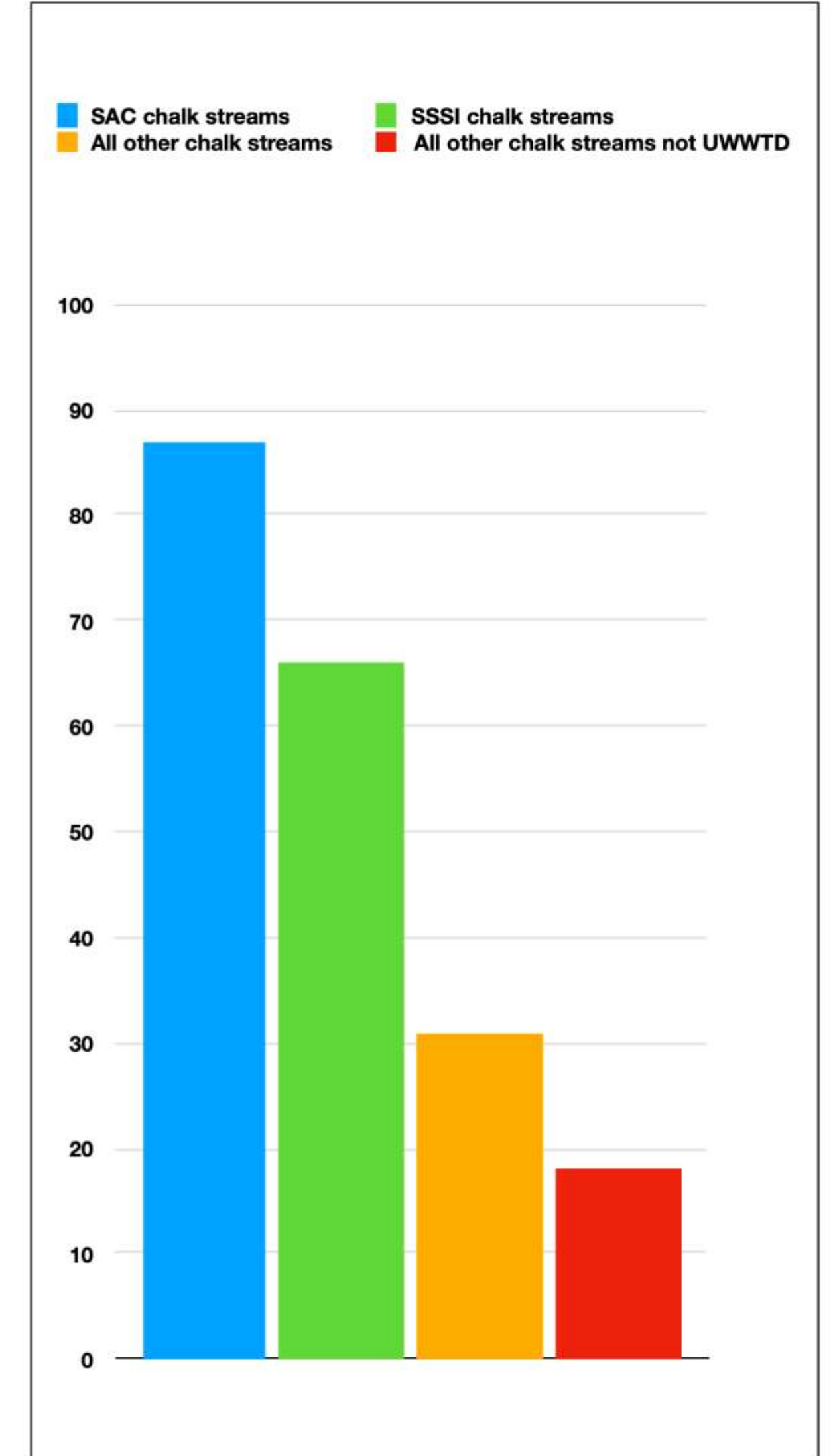
The River Beane – A40%R

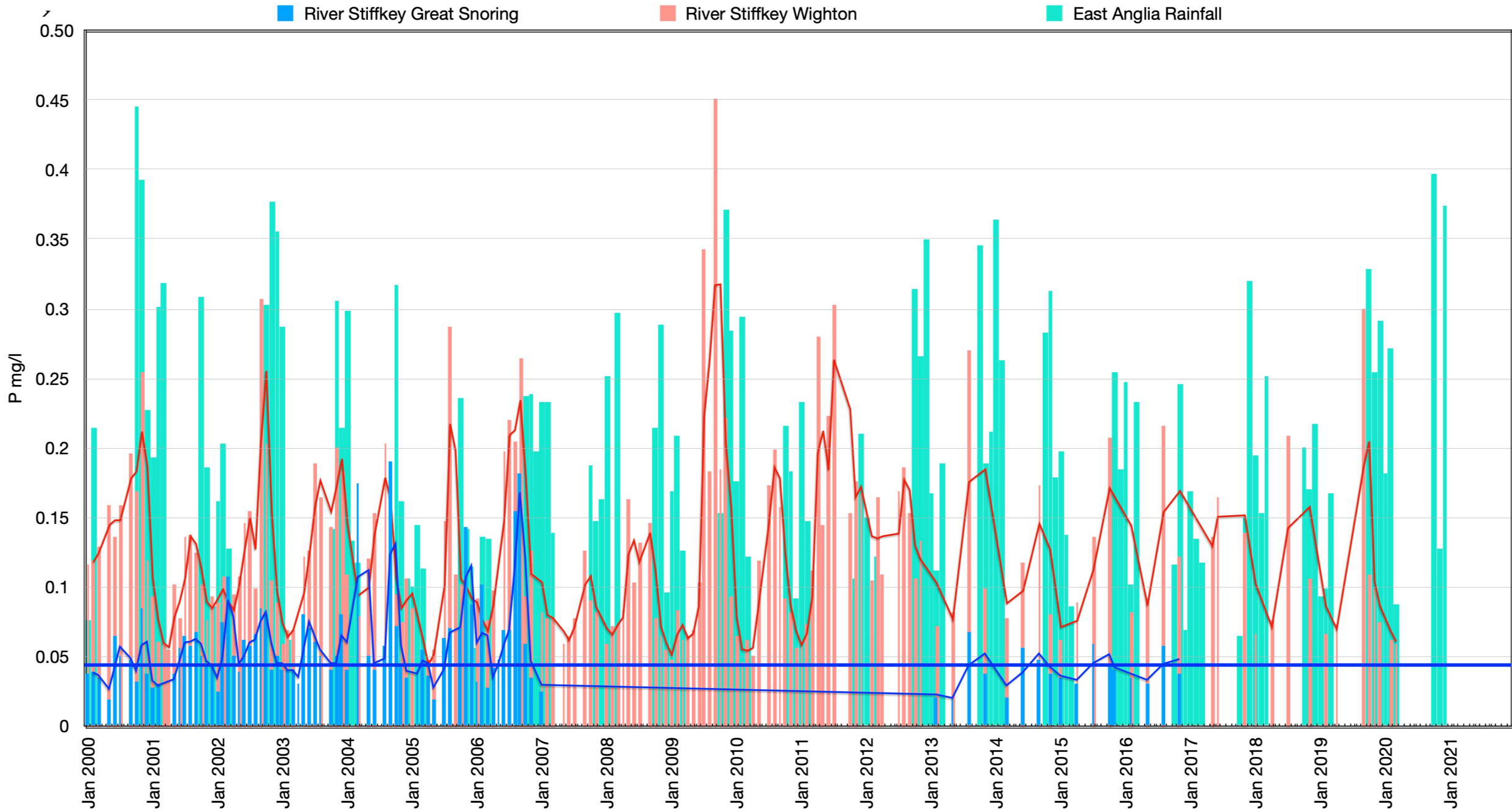


The River Mimram – A15%R

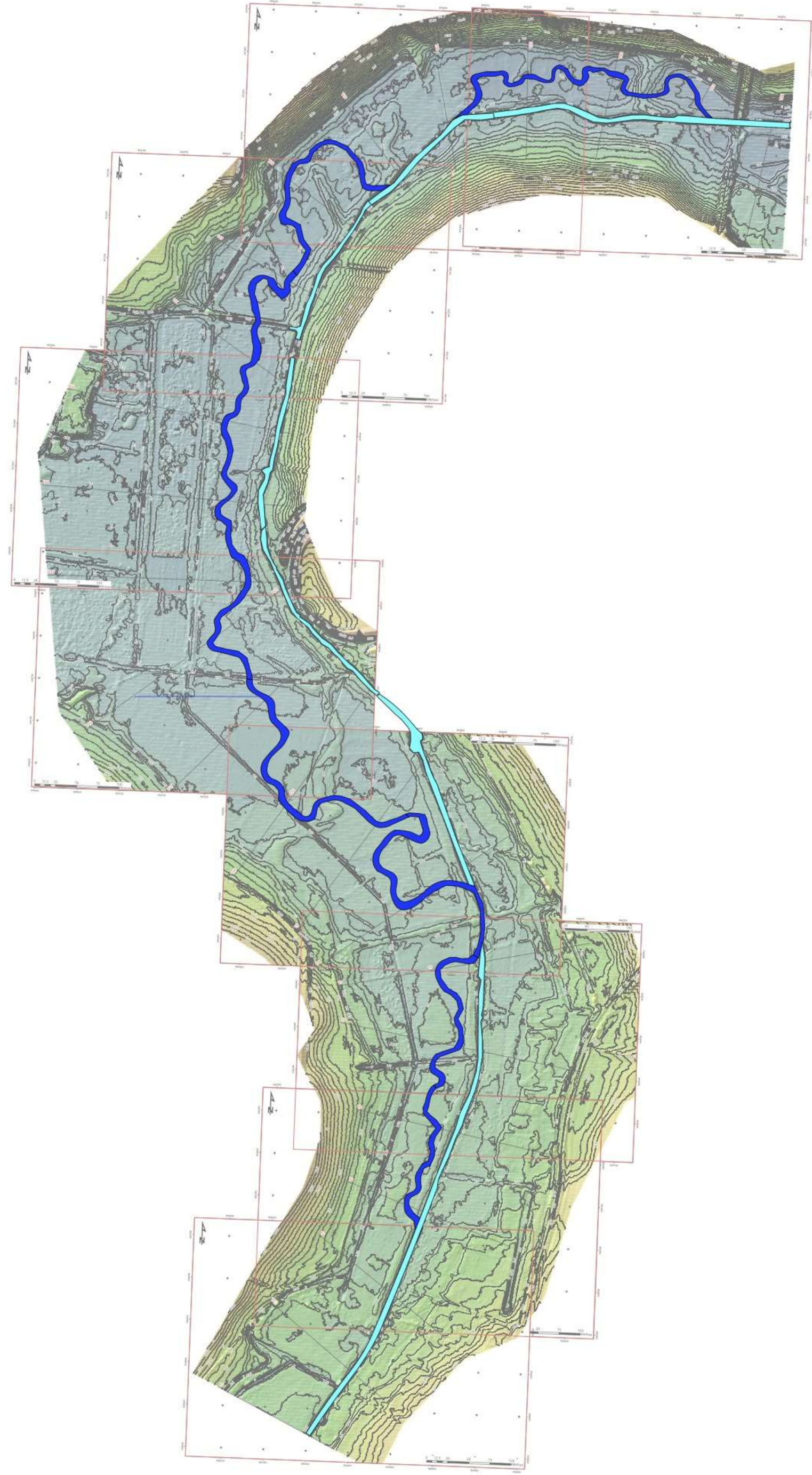
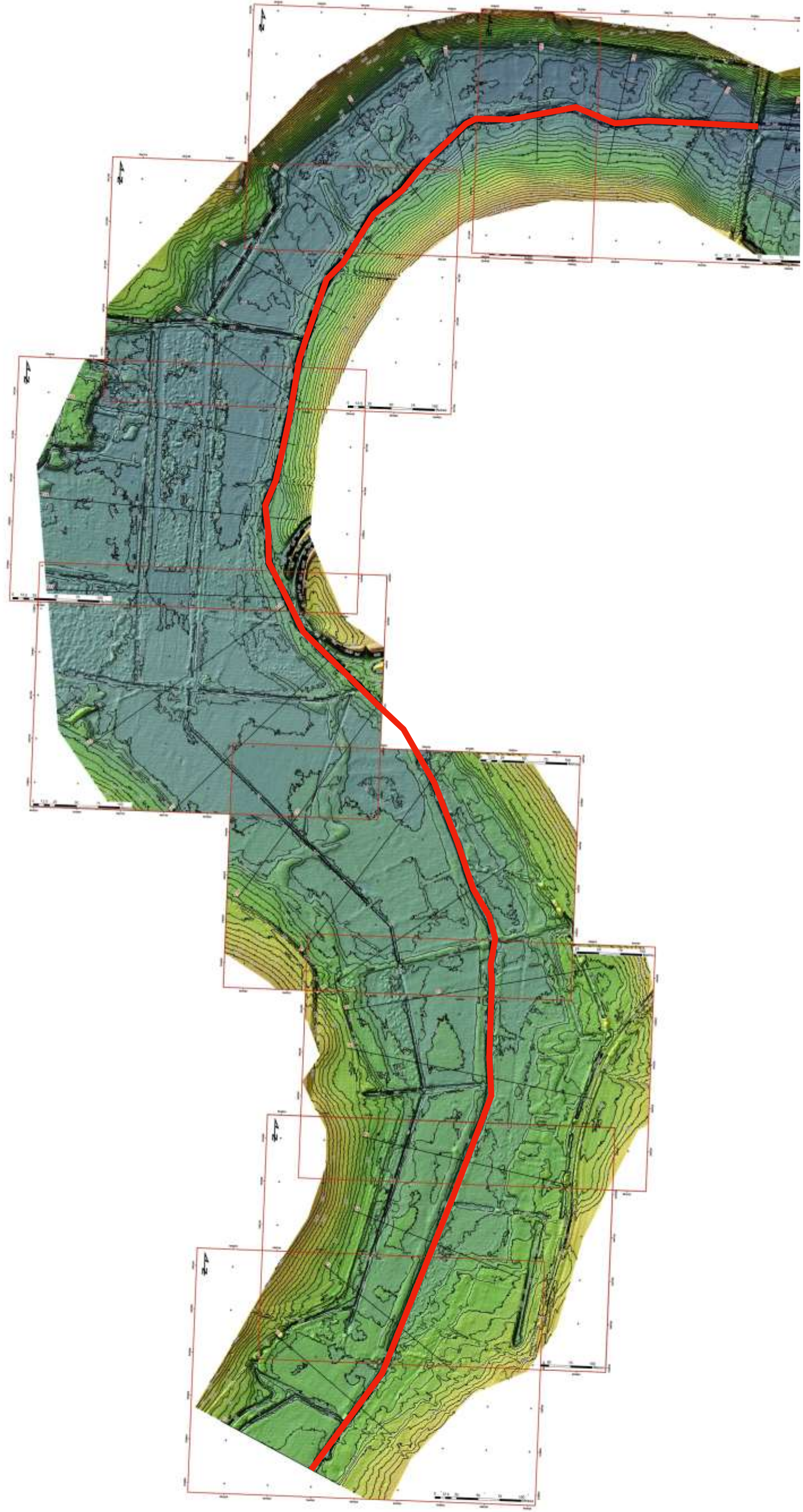




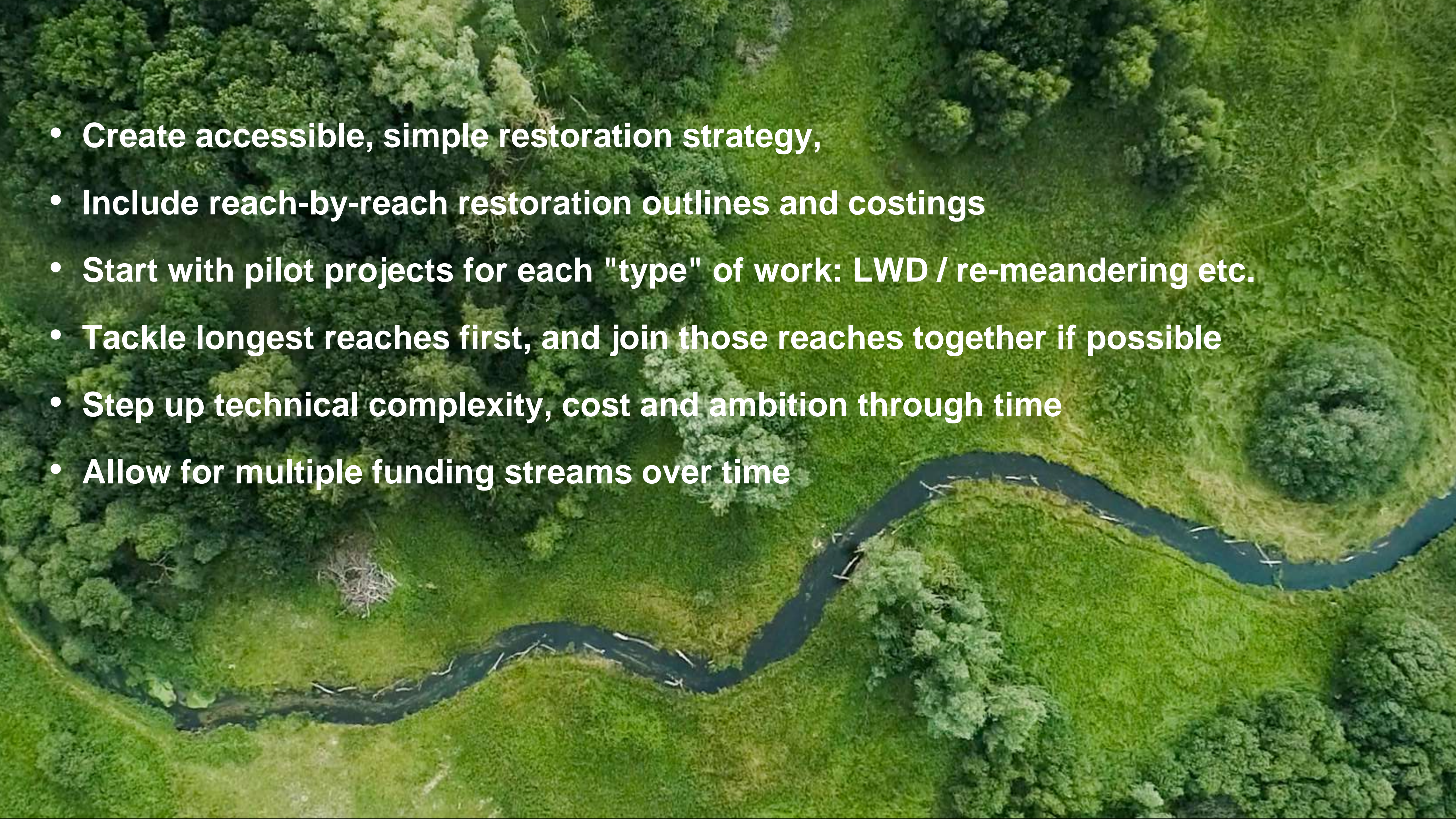




River Stiffkey: EA's Phosphate readings 2000 - 2016
0.048 and below = High / 0.098 and below = Good status for phosphate





- 
- An aerial photograph of a river meandering through a dense, green forest. The river is dark and flows from the top right towards the bottom left, with several sharp turns. The surrounding land is covered in thick vegetation, with varying shades of green. The text is overlaid on the left side of the image.
- **Create accessible, simple restoration strategy,**
 - **Include reach-by-reach restoration outlines and costings**
 - **Start with pilot projects for each "type" of work: LWD / re-meandering etc.**
 - **Tackle longest reaches first, and join those reaches together if possible**
 - **Step up technical complexity, cost and ambition through time**
 - **Allow for multiple funding streams over time**

Build it and they will come ...

