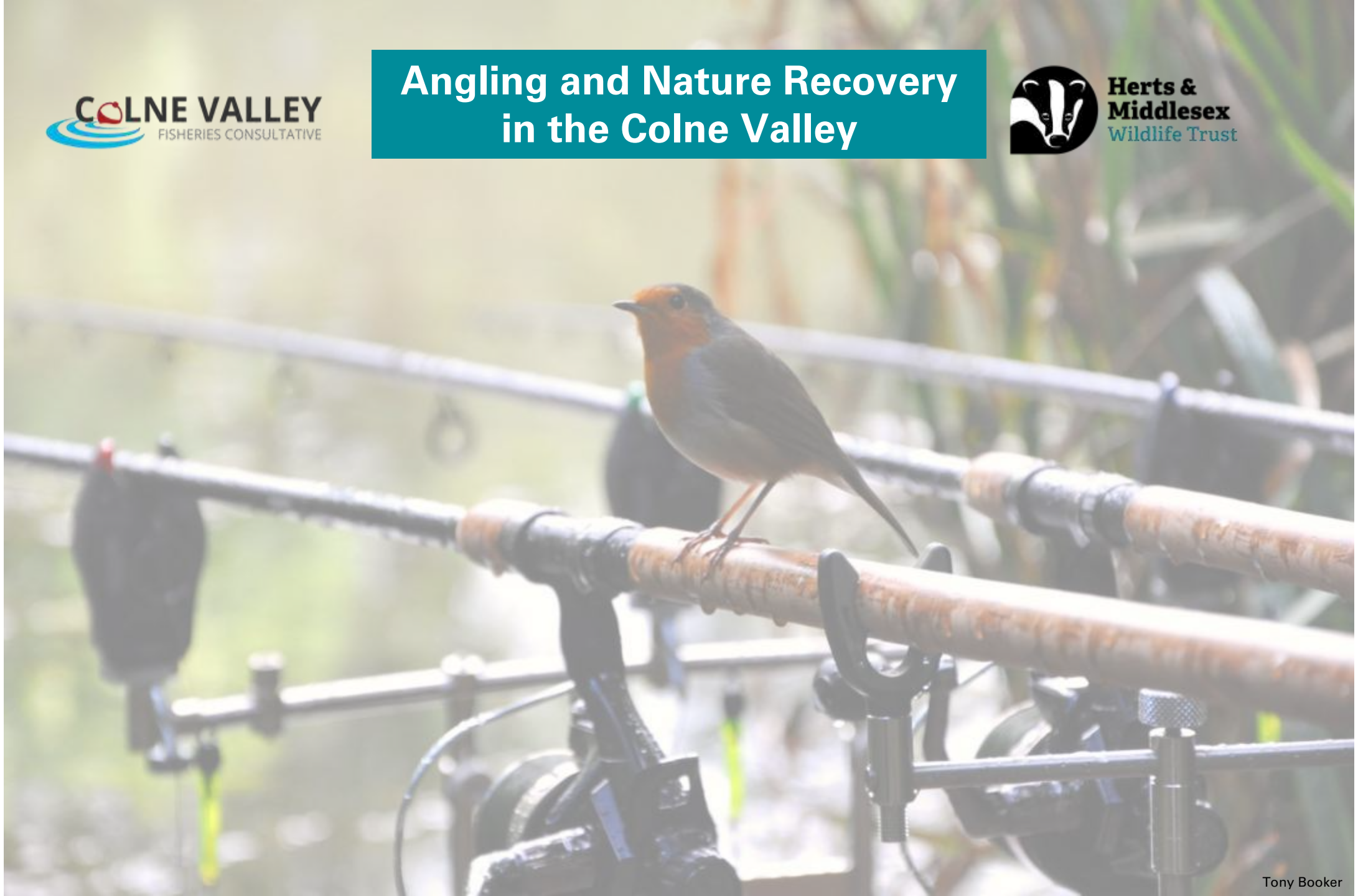
ColneCAN Conference April 2022

COLNE VALLEY
FISHERIES CONSULTATIVE

Angling and Nature Recovery in the Colne Valley

Herts & Middlesex Wildlife Trust



Tony Booker

Anthony Johns


Tony Booker


Tony Booker


Tony Booker


Tim Hill

Deliver fisheries and wetland management training to angling clubs within the Colne Valley

Help anglers to produce fisheries management plans

Support angling clubs to implement management plans and deliver enhancements for fish and wildlife

Anthony Johns

Angling and Nature Conservation course

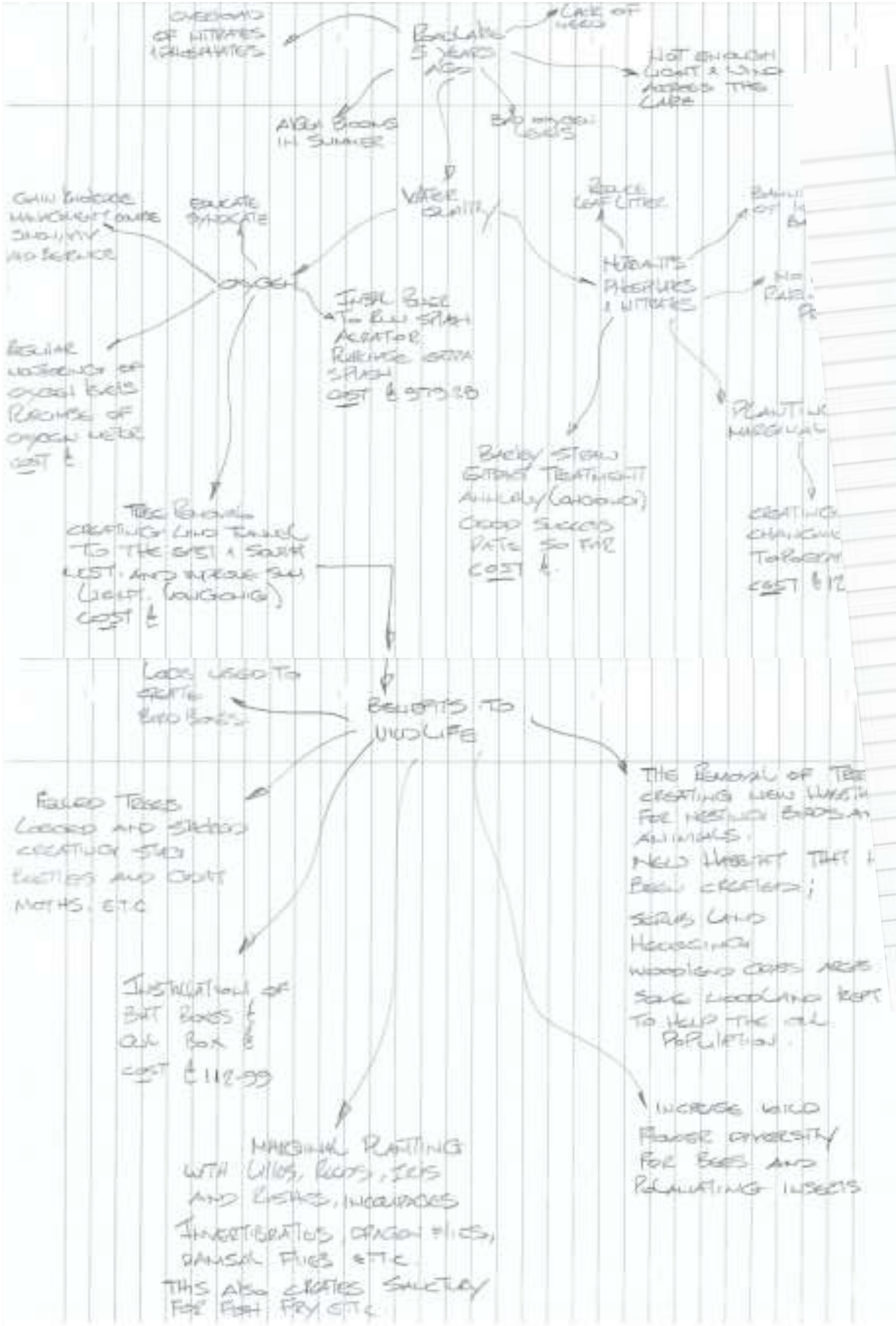
- Five day course
- Accredited under AQA Unit Award Scheme
- Four modules: Fisheries Management, Wetland Ecology, Introduction to Management Planning and Managing Change – certificates received for each
- Delivered by a team of expert tutors: Viv Shears & Bernice Brewster, Graham White, Kate Measures


2019


2020

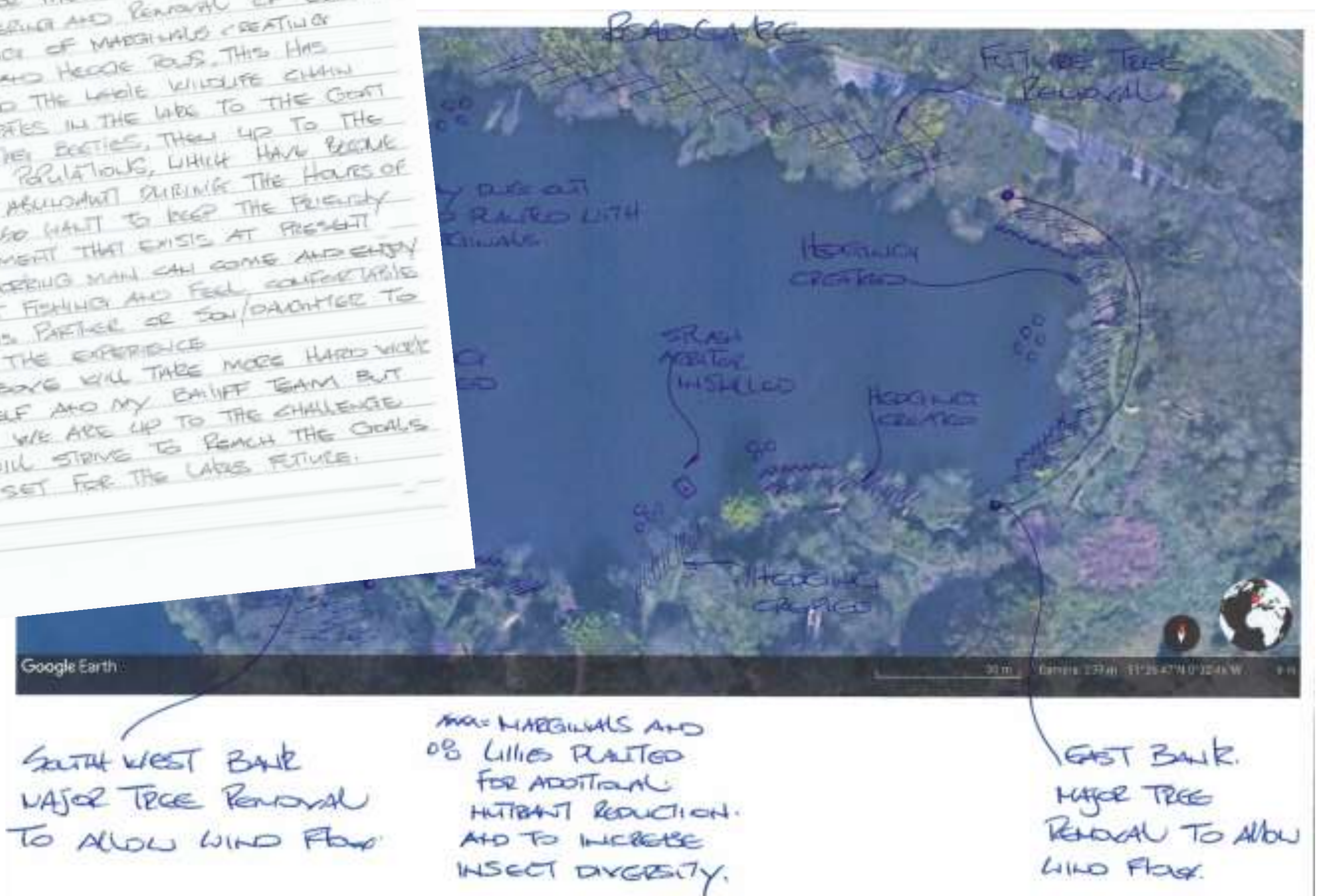

2021


2022


OVERLOAD OF NITRATES & PHOSPHATES
LACK OF WEED
NOT ENOUGH LIGHT & WIND ACROSS THE LAKE
ALGAE BLOOMS IN SUMMER
BAD OXYGEN LEVELS
WATER QUALITY
EDUCATE SYNDICATE
OXYGEN
REDUCE LEAF LITTER
NUTRIENTS PHOSPHATES & NITRATES
REGULAR MONITORING OF OXYGEN LEVELS PURCHASE OF OXYGEN METER COST £
BARLEY STRAW EXTRACT TREATMENT ANNUALLY (ONGOING) GOOD SUCCESS RATE SO FAR COST £
TREE REMOVAL CREATING WIND TUNNEL TO THE EAST & SOUTH WEST, AND IMPROVE SUN LIGHT (ONGOING) COST £
BENEFITS TO WILDLIFE
FELLED TREES LOGGED AND STACKED CREATING STAG BEETLES AND GOAT MOTHS. ETC
THE REMOVAL OF TREES CREATING NEW HABITATS FOR NESTING BIRDS AND ANIMALS.
NEW HABITAT THAT HAS BEEN CREATED; SCRUB LAND HEDGING WOODLAND GRASS AREAS SOME WOODLAND KEPT TO HELP THE OWL POPULATION.
INSTALLATION OF BAT BOXES £ OWL BOX £ COST £112-99
MARGINAL PLANTING WITH LILLIES, REEDS, IRIS AND RUSHES, INCORPORATES INVERTIBRATES, DRAGON FLIES, DAMSEL FLIES ETC THIS ALSO CREATES SANCTUARY FOR FISH FRY ETC
INCREASE WILD FLOWER DIVERSITY FOR BEES AND POLLINATING INSECTS

LAKE VISION

MY VISION FOR THE LAKE GOING FORWARD OVER THE COMING YEARS IS TO CONTINUE BUILDING ON THE VAST IMPROVMENTS THAT HAVE BEEN ACHIEVED UNTIL NOW. WE WILL CARRY ON MONITORING THE WATER QUALITY AND STRIVE TO KEEP PROGRESSING THE FISH WEIGHTS AND RETAINING THERE GREAT CONDITION, IN TURN WE WILL PRESS ON CREATING A WONDERFULL ENVIROMENT FOR THE WILDLIFE, WITH THE ON GOING LOWERING AND REMOVAL OF CERTAIN TREES, PLANTING OF MARGINALS CREATING SCRUB LAND AND HEDGE ROWS. THIS HAS ALSO INCREASED THE WHOLE WILDLIFE CHAIN FROM INVERTIBRATES IN THE LAKE TO THE GOAT MOTHS AND STAG BEETLES, THEN UP TO THE OWL AND BAT POPULATIONS, WHICH HAVE BECOME MUCH MORE ABUNDANT DURING THE HOURS OF DARKNESS. I ALSO WANT TO KEEP THE FRIENDLY SAFE ENVIROMENT THAT EXISTS AT PRESENT WHERE THE WORKING MAN CAN COME AND ENJOY SOME GREAT FISHING AND FEEL COMFORTABLE BRINGING HIS PARTNER OR SON/DAUGHTER TO APPRECIATE THE EXPERIENCE
ALL THE ABOVE WILL TAKE MORE HARD WORK FROM MYSELF AND MY BAILIFF TEAM BUT I AM SURE WE ARE UP TO THE CHALLENGE AND WE WILL STRIVE TO REACH THE GOALS THAT WE SET FOR THE LAKES FUTURE.


FUTURE TREE REMOVAL
HEDGING CREATED
SPLASH AERATOR INSTALLED
HEDGING CREATED
HEDGING CREATED
Google Earth
SOUTH WEST BANK MAJOR TREE REMOVAL TO ALLOW WIND FLOW
MARGINALS AND LILLIES PLANTED FOR ADDITIONAL NUTRIENT REDUCTION. AND TO INCREASE INSECT DIVERSITY.
EAST BANK. MAJOR TREE REMOVAL TO ALLOW WIND FLOW


STIHL
STIHL


STIHL


LANTRA
AWARDS
Certificate of Competence
Chainsaw Maintenance and Cross-cutting

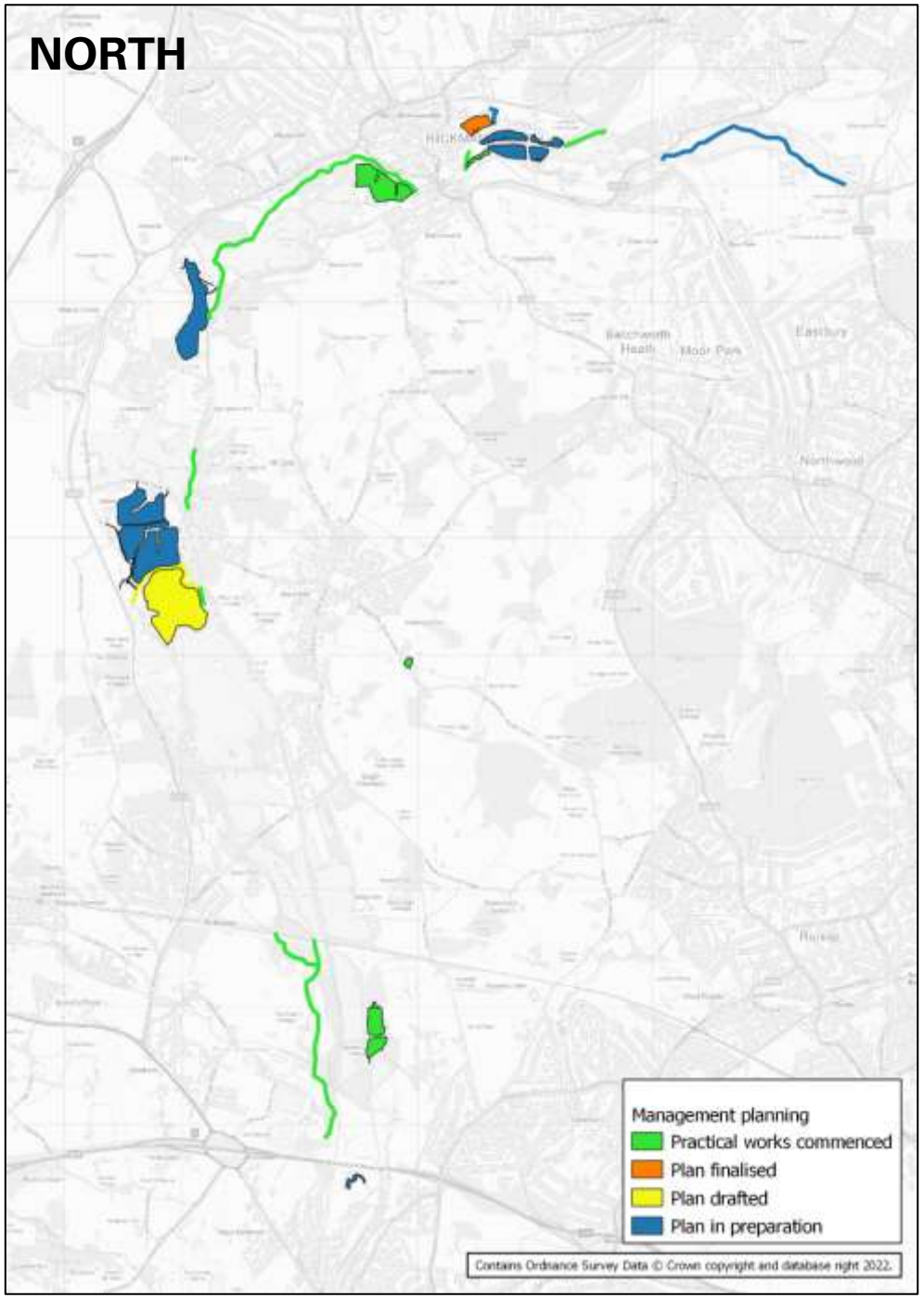
44 anglers trained in fisheries and wetland management

28 fisheries engaged in management planning

13 sites delivering enhancements for fish and wildlife

8km of river corridor managed sympathetically for water voles by angling clubs

Anthony Johns


NORTH
Management planning
Practical works commenced
Plan finalised
Plan drafted
Plan in preparation
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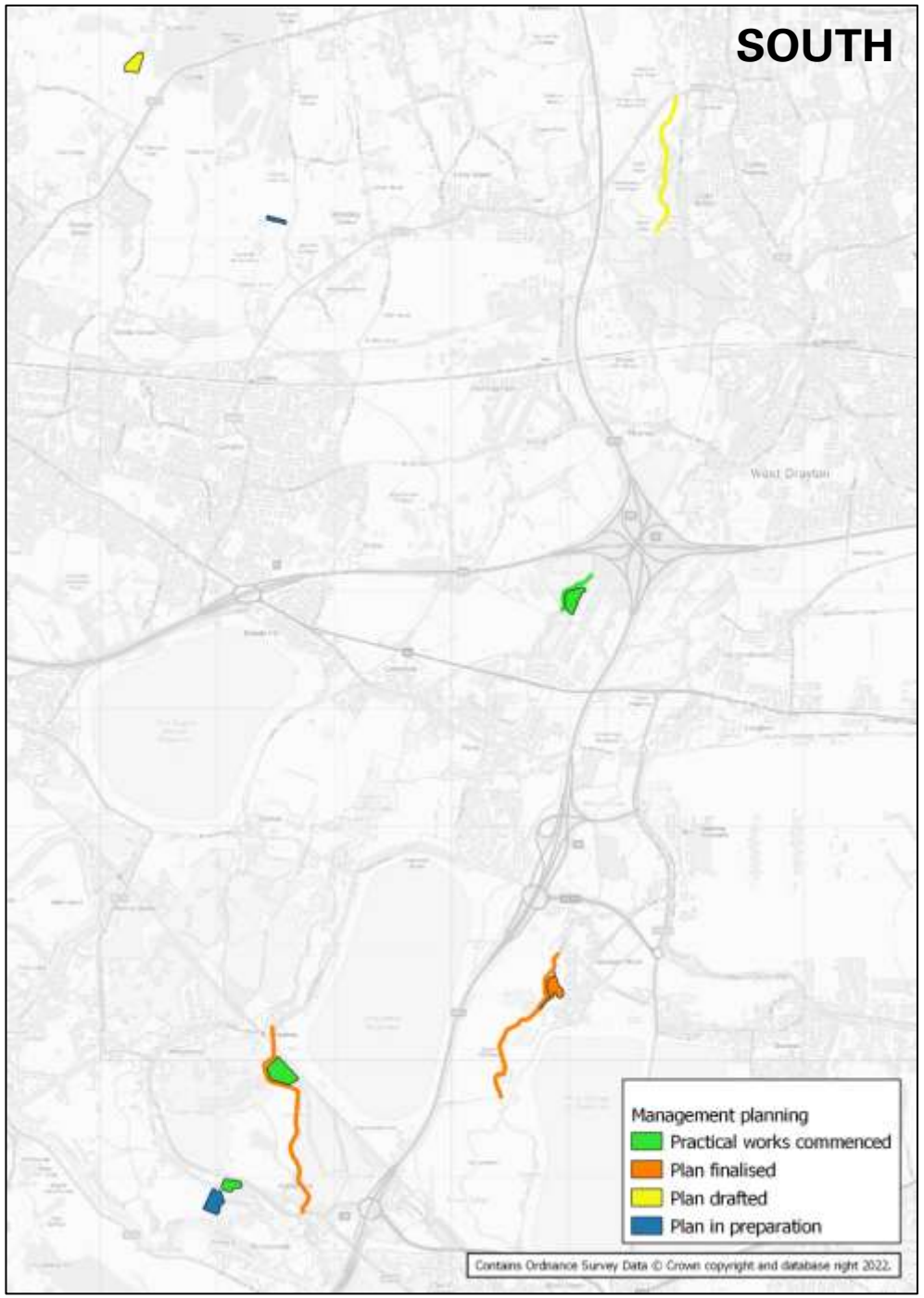
SOUTH
Management planning
Practical works commenced
Plan finalised
Plan drafted
Plan in preparation
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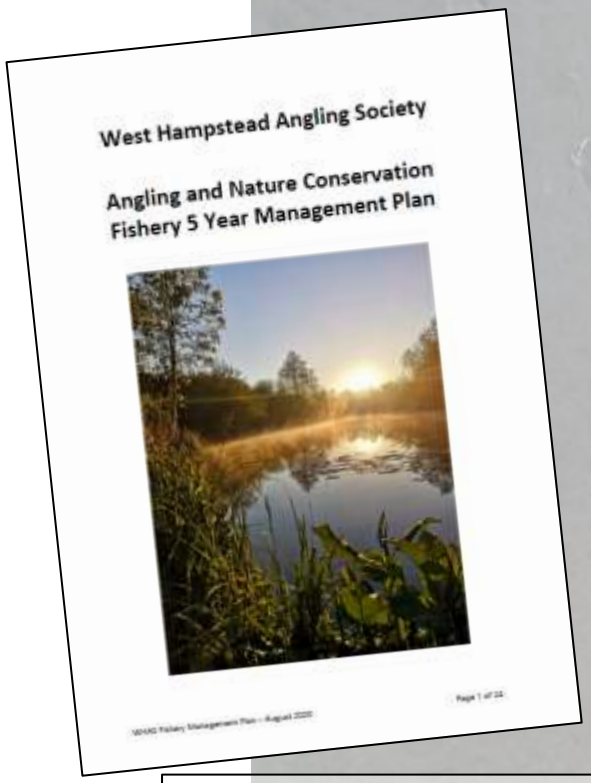
West Hampstead Angling Society – Sabeys Pool



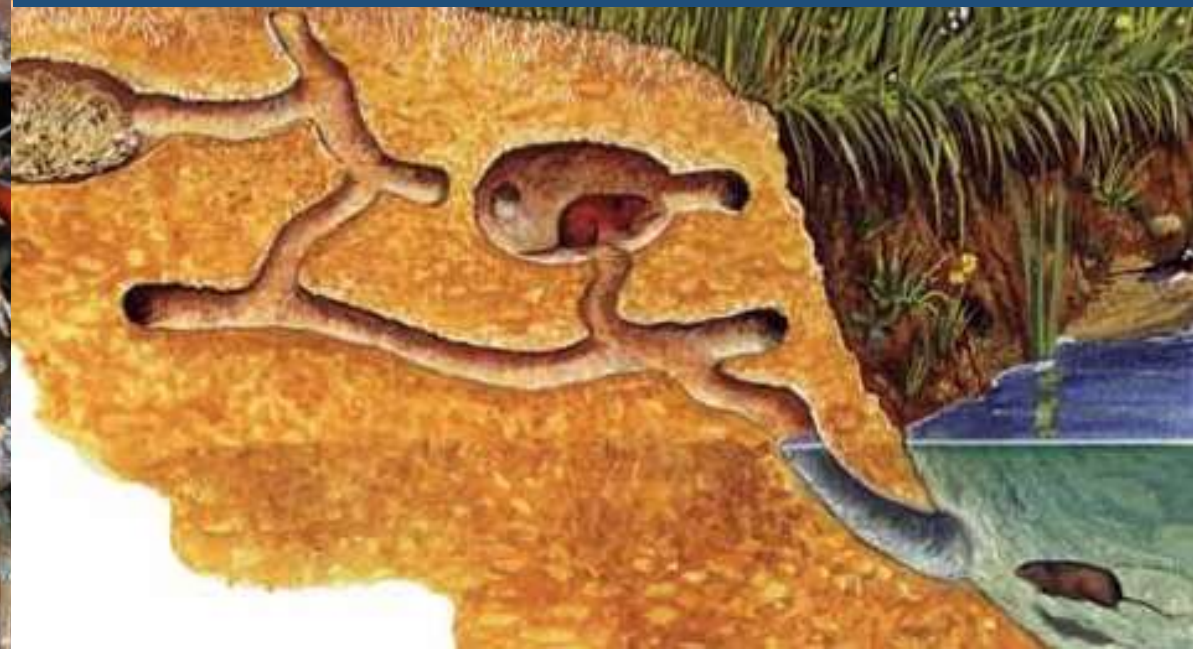
At the heart of our vision and development plan is the restoration to the lake of some of the local wildlife and their habitat that has been lost in recent years.

Our effective long-term plan will ensure that once established, this wildlife is not lost again. We will increase our understanding of the site and be able to deliver a habitat that not only secures it as an excellent angling venue but also a first-class habitat for wildlife.

We foresee members regularly spotting Water Voles living in the replanted bank side vegetation and Kingfishers, once again, nesting in the raised banks.

How to deal with invasive species…

Why to deal with invasive species…



How to create water vole habitat…

All image credits Anthony Johns

How to create water vole habitat…

All image credits Anthony Johns

How to create water vole habitat…

All image credits Anthony Johns

How to make a kingfisher bank…

All image credits Anthony Johns

All image credits Tony Booker

Wildlife Site Survey Report for: Croxley Hall Lakes

This report is an assessment of the plants and habitats found on the site following the recent survey done by Herts & Middlesex Wildlife Trust (HMWT). It offers some advice for how the site's biodiversity could be further enhanced, although it is understood that the management advice is entirely at the discretion of the landowner. It is recognised that there are a number of factors that determine site management decisions, and the Wildlife Sites Officer based at HMWT would welcome the opportunity to come and discuss the landowner's objectives and the proposals in this report in greater detail with the landowner.

Herts and Middlesex Wildlife Trust survey and provide advice for over 50 Local Wildlife Sites per year. We offer this service to owners of Local Wildlife Sites free of charge. If you would like to support our work, you can become a member, and join more than 20,000 others in Hertfordshire and Middlesex who say wildlife matters to them. Registered in England No 816710. Registered Charity No 239863


Herts &
Middlesex
Wildlife Trust
COLNE VALLEY
FISHERIES CONSULTATIVE
Colne Valley Regional Park
HERITAGE
FUND

Tackling Invasive Species with the Help of Volunteers

By Joshua Bowes

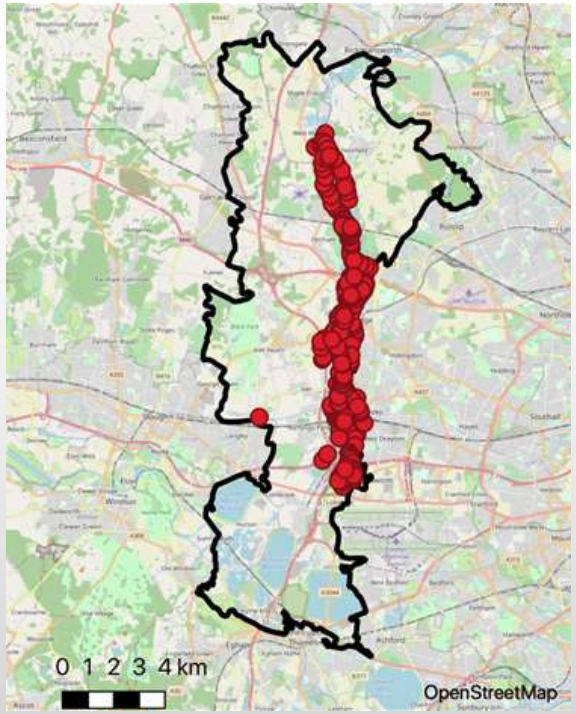
River Rangers and Volunteering

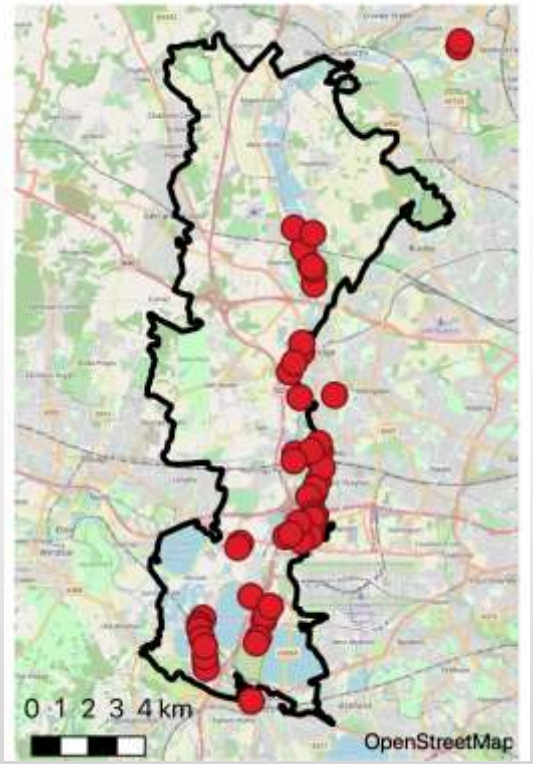
- Volunteering represents a way for citizens to engage in conservation and to be part of nature (physically, emotionally and ecologically), to help the environment, and to experience an enjoyable, self-enhancing and socially integrating activity (Pages ET AL. 2019).
- Formed in 2019
- Over 100 volunteers
- Over 140 people signed up to the newsletter
- Covering a wide range of activities from River fly monitoring to river restoration and invasive species management to habitat management

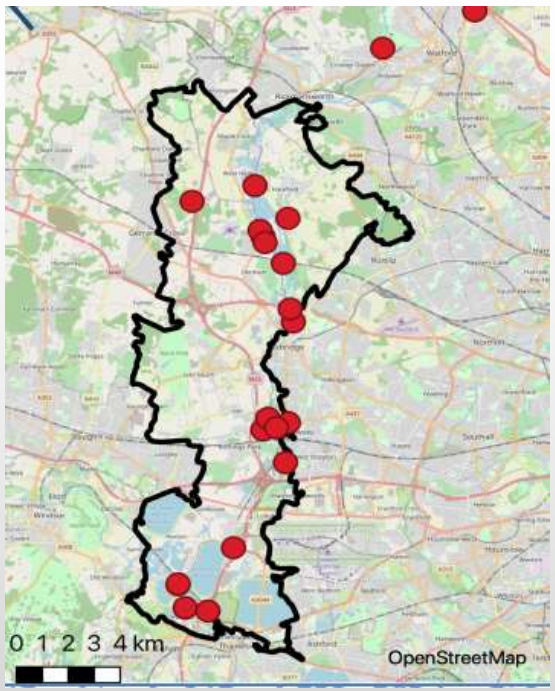
What is a non native invasive species (NNIS)?

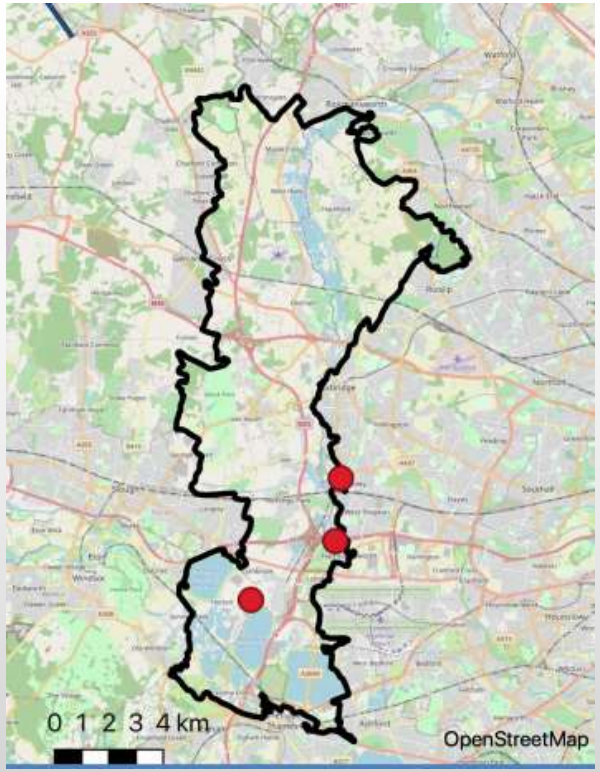
- An non-native invasive species is a species introduced (i.e. by human action) outside its natural past or present distribution that has the ability to spread causing damage to the environment, human economy or human health.
- They are listed under Schedule 9 of the Wildlife and Countryside Act 1981 with respect to England and Wales. As such, it is an offence to plant or otherwise allow this species to grow in the wild.
- Cost the Uk £1.7 Billion ever year in 2010 (Williams et al. 2010) (£2.2 billion after inflation) with Freshwater invasions costing £43.5 Million in 2011(Oreska and Aldridge 2011) (£56.4 Million after inflation) (Cuthbert ET AL. 2021)


@RPS group Plc









distributions

What volunteers are doing to stop NNIS

- Training
- Raising awareness
- Surveys
- Removal

Surveys and training

- We have run over 5 training sessions
- 49 volunteers have spent 202 hours over 3 years surveying
- This has allowed us target specific areas

Manual removal

- Using hand tools
- The volunteers have cleared 21932 m²
- They have spent 1515.5 Hours removing invasive species

The future

- Weevils and rust fungus
- Boom teams
- More species to combat

References

- Pages, M., Fischer, A., van der Wal, R., & Lambin, X. (2019). Empowered communities or “cheap labour”? Engaging volunteers in the rationalised management of invasive alien species in Great Britain. Journal of Environmental Management, 229, 102-111.
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- Cuthbert, R., Bartlett, A., Turbelin, A., Haubrock, P., Diagne, C., Pattison, Z., ... & Catford, J. (2021). Economic costs of biological invasions in the United Kingdom. *NeoBiota*, *67*, 299-328.
- Aldridge, D., Ockendon, N., Rocha, R., Smith, R.K. & Sutherland, W.J. (2020) Some Aspects of Control of Freshwater Invasive Species. Pages 555-87 in: W.J. Sutherland, L.V. Dicks, S.O. Petrovan & R.K. Smith (eds) *What Works in Conservation 2020*. Open Book Publishers, Cambridge, UK.

“WE’VE GOT SOMETHING YOU MIGHT LIKE TO SEE”

Rediscovering the River Colne 2021-2031

WATFORD BOROUGH COUNCIL


Rediscovering the...
River Colne

A partnership…….

Thames Water

Affinity Water

Rediscovering the River Colne

GROUNDWORK
CHANGING PLACES
CHANGING LIVES

What is it?

- A 10 year £2.7M commitment led by Watford Borough Council to improve the River Colne with the support of a wide range of partners
- Focuses on:
  - Improvements to 2.2KM of the river to improve water quality and biodiversity
  - Improved public access to the River Colne
  - Monitoring the environmental condition of the river to improve management
  - Engagement and education to enable the community to learn about the river and to support us in our aim to restore, protect and enjoy
- Involves 7 Watford BC sites

Rediscovering the River Colne

GROUNDWORK CHANGING PLACES CHANGING LIVES

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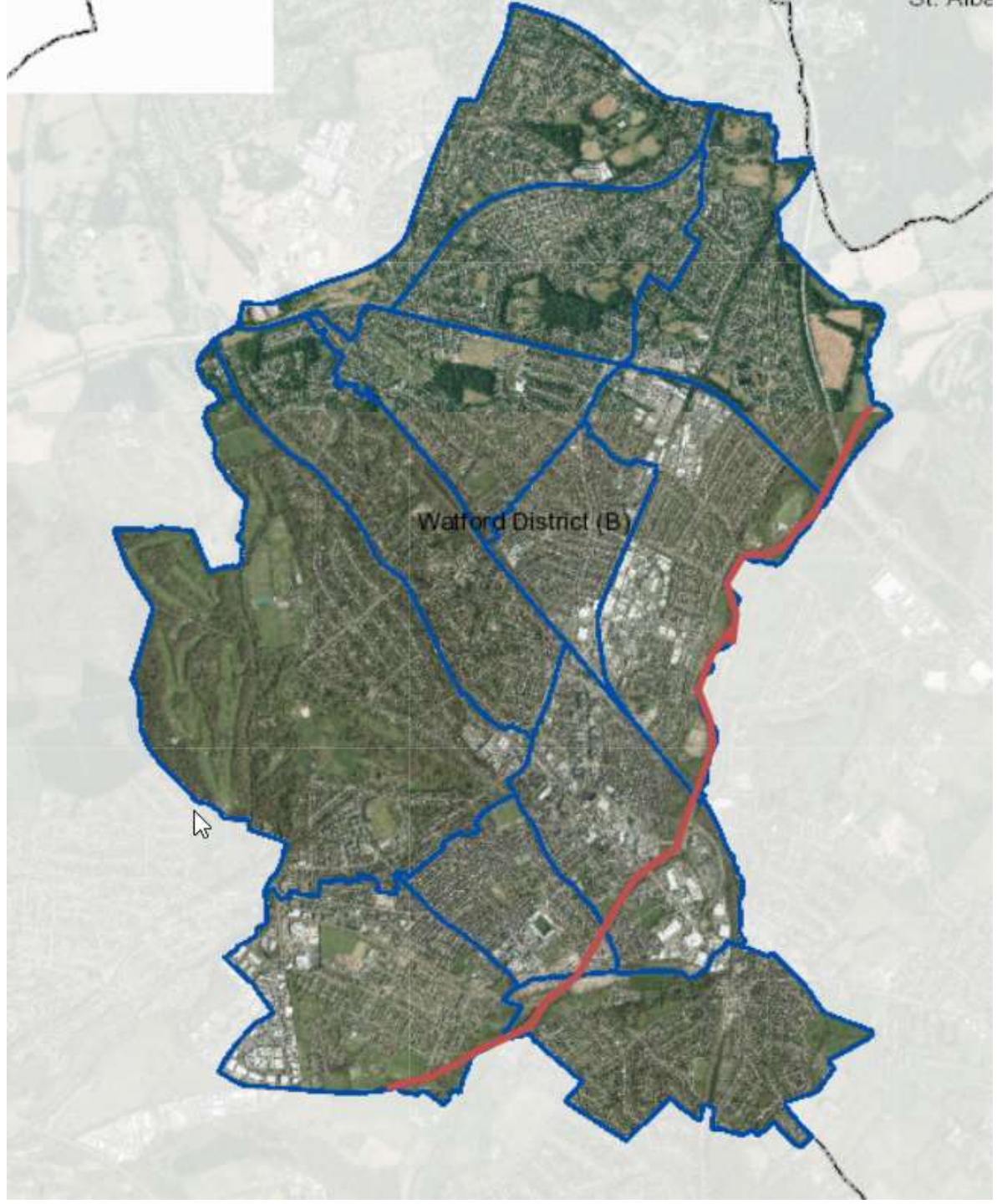

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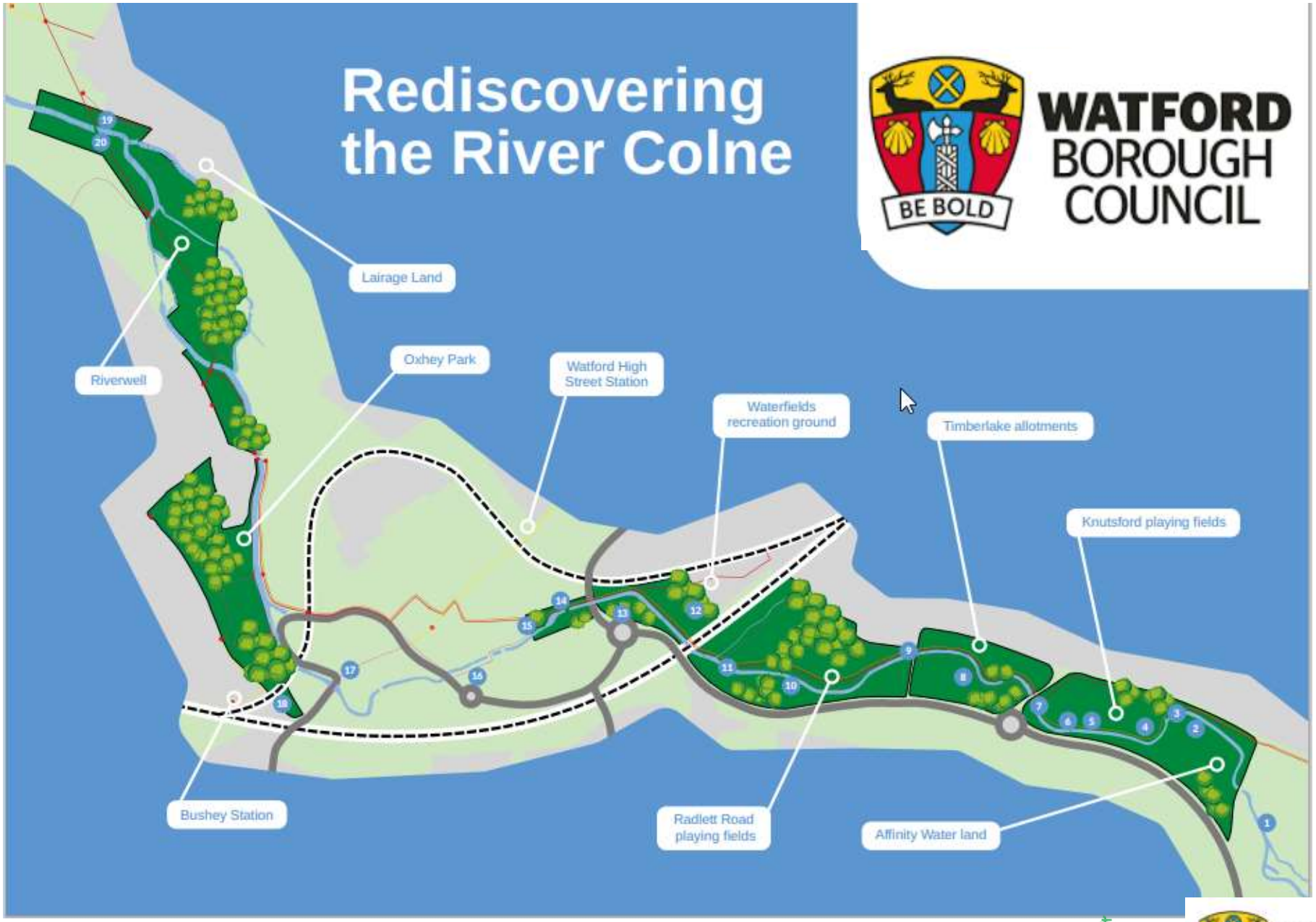
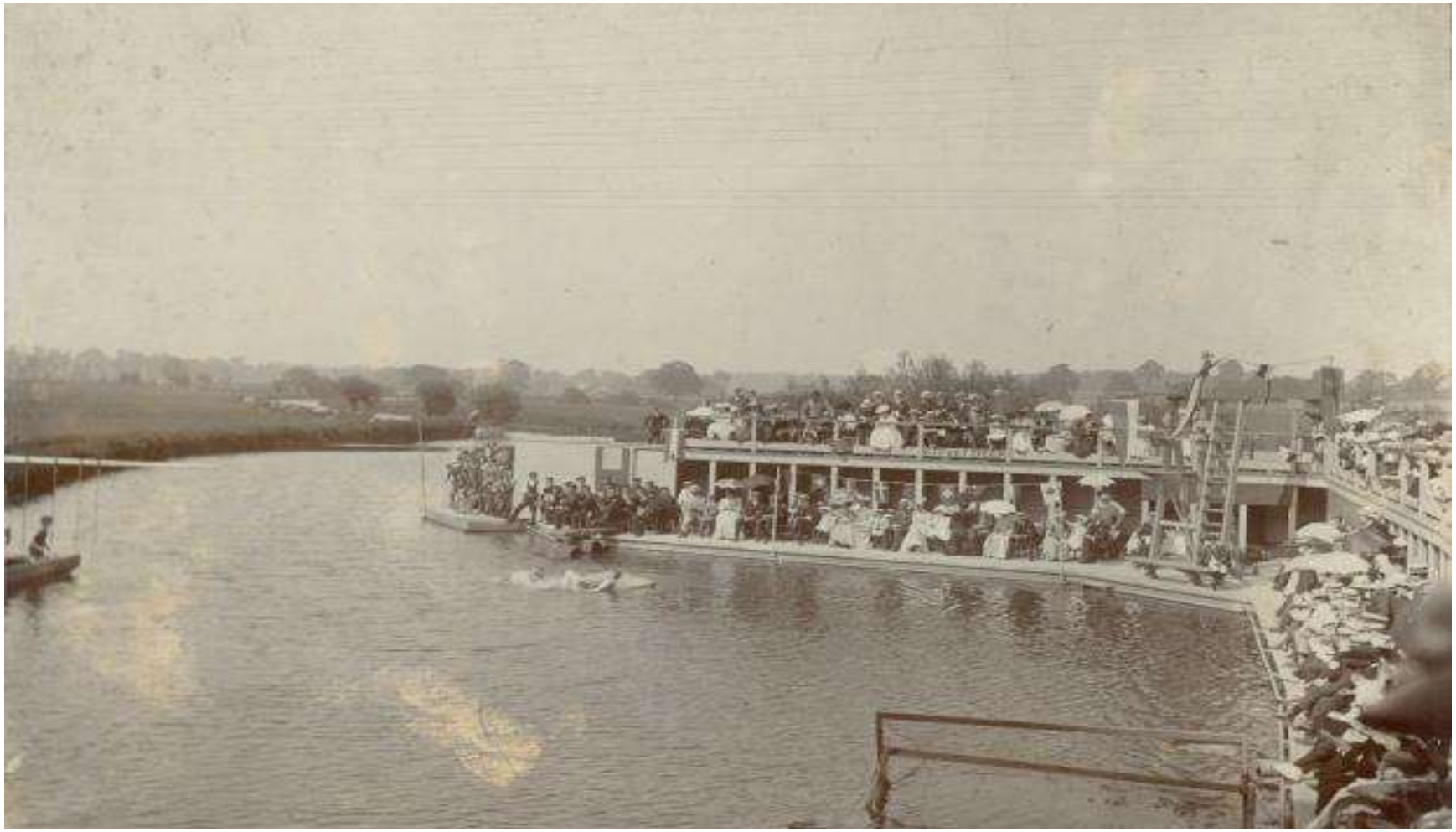

Rediscovering the River Colne
WATFORD BOROUGH COUNCIL
BE BOLD
Lairage Land
Riverwell
Oxhey Park
Watford High Street Station
Waterfields recreation ground
Timberlake allotments
Knutsford playing fields
Bushey Station
Radlett Road playing fields
Affinity Water land

What are the issues

- Pollution from misconnections and surface water
- Invasive non native species
- Low flows, leading to siltation
- Too much tree cover in places
- Lack of geodiversity/biodiversity
- Climate change
- Not perceived as accessible and unkempt in some places
- Lack of awareness of the river, its importance to the town and people and issues around water quality.

Relationships and values



How…

What are our targets

Activity	Outcomes 2021- 2024
Physical improvements to the river and adjoining habitat	
Improved functioning river and site enhancement	• 2.2km of river improved • 10 floodplain habitat features installed • 5 sites adjacent to the river improved • Feasibility assessment for a constructed wetland enhancement scheme
Improved biodiversity for native flora	• 6.4km^2 area sown with UK native plants species • 5km of river surveyed for non-native invasive species including: Himalayan Balsam, Giant Hogweed and Japanese Knotweed. Awareness of the issue raised locally. • Annual report analysing spread and severity of non-native invasive species in target area.
Engaging the community	
Residents awareness raised of the impact of their actions on the river and how to reduce this	• 12,000 residents reached through all media and varied events with information that gives them a greater understanding of where water comes from, and how & why to reduce their usage to leave more in the environment
Development and delivery of a programme of a range of tasks and events to engage the whole community	• 1,500 individuals and 20 business involved in projects and activities including litter picking, surveying and habitat management. 4,500 volunteer hours. • 50 adults, 15 schools (500 pupils) and 50 young people participating in the River Colne education programmes • 100 individuals participating in health and wellbeing activities • 100 individuals participating in arts and heritage projects

What are our targets

Activities to engage and involve people in protecting the river landscape	
Enhance existing citizen science activity to provide appropriate/adequate training for volunteers to collect meaningful water quality information	• 40 citizen science volunteers recruited and trained in six survey techniques. • 1,000 volunteer hours of survey activity delivered and recorded • Annual water quality report produced using collected riverfly, outfall safari and water chemical testing information and highlighting pollution hotspots to guide future activity and provide baseline • Water quality forum to meet 4 times per year to assess and progress water quality issues with key stakeholders. • 1 conference/event run each year
Development of the river access and surrounding landscape	
Improved physical access to the river corridor	• Develop two destination points through seating and interpretation at key points, improved access points and their visibility.
Improved river signage and interpretation	• 26 signs installed along 5km of walks • Signed heritage walk created and interpreted on site and via leaflet and on-line information
Funding	
Funding	• Match funding obtained of £335,000 by 2024 via grant applications, corporate and public funding and development opportunities.

Progress...

- 2019-2021 – Assessments/Feasibility Studies/Proposals
- Oct 2021: Proposals approved by Cabinet
- Oct 21 – Feb 22: First phase of access and landscape improvements implemented
- Oct 21 – Mar 22: Public consultations, arts projects, events programme, arts competition, water quality forum, volunteer recruitment
- Oct 21 – May 22: In river design options in development and technical modelling, stakeholder engagement, potential big change to Knutsford
- Dec 21 – May 22: NHLF bid – 'Tales of the River Colne'
- Development of water quality forum, water quality monitoring

WATFORD BOROUGH COUNCIL

How are we doing..

- Events: 28
- Volunteers recruited:17
- Schools engaged: 6
- School Pupils engaged: 257
- Businesses engaged: 21
- Volunteer hours: 476
- Heritage event attendees: 859

As of end of March 2022

GROUNDWORK
CHANGING PLACES CHANGING LIVES

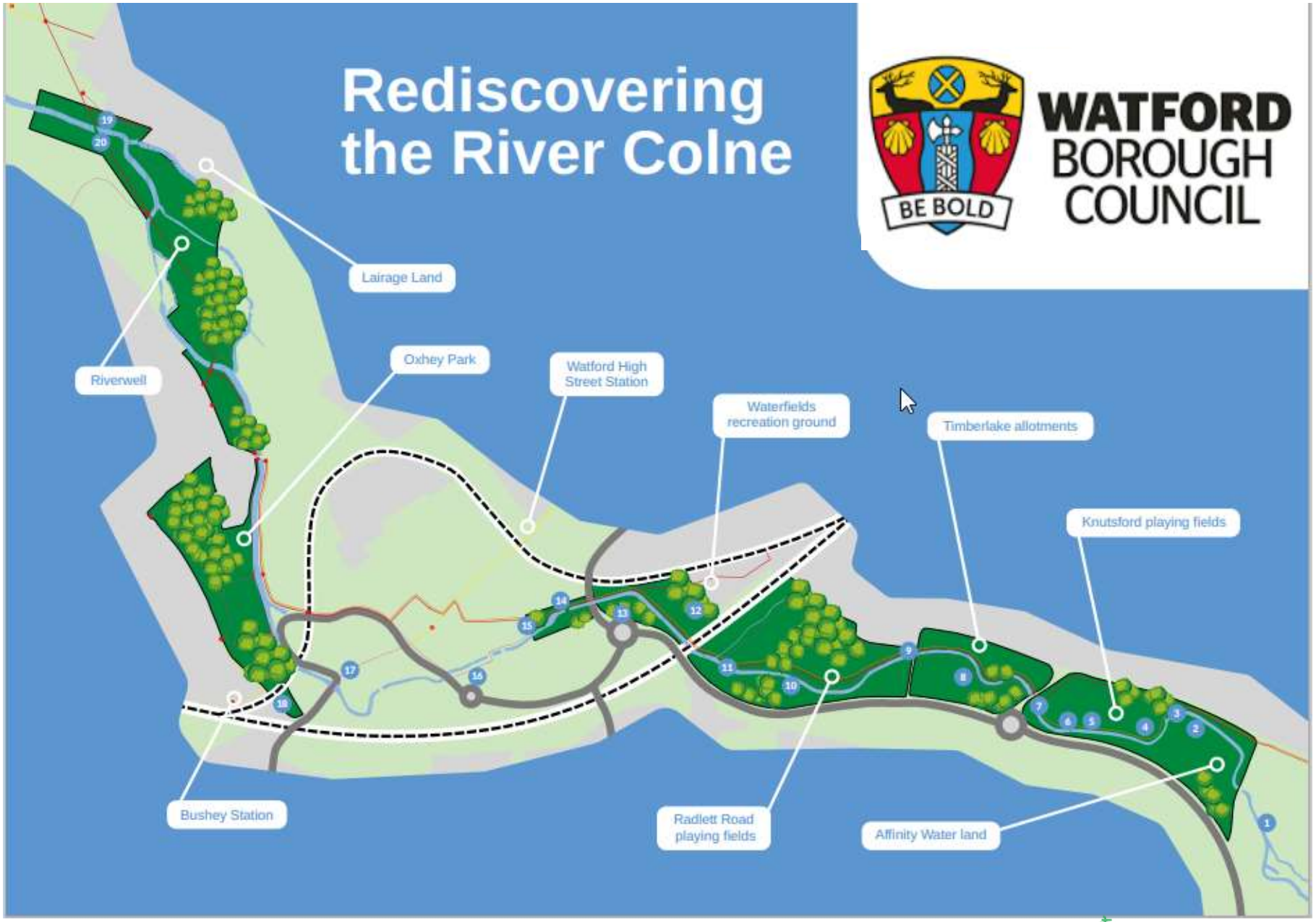
WATFORD BOROUGH COUNCIL
BE BOLD

What's the impact of the engagement activities…

- Most participants are aware that the river flows through Watford, with the most known stretches of the river at Oxhey Park, Radlett and Knutsford Playing Fields.
- Most participants are well versed with some of the main issues along this stretch of the river, with the most common issues highlighted being litter, pollution through runoff and sewage outfalls and non-native invasive species.
- Most individuals spend regular time by the river, with respondents most commonly spending a 1-2 hours at the riverside a few times a week or a few times a month.
- In terms of barriers to use, issues highlighted included rubbish in waterways, limited or non-existent access to the river (footpaths, Tesco area), limited or no parking provision in some parks, safety and antisocial behaviour issues.
- Positive change: 75% said that sessions had encouraged them to use the river corridor.
- 90% wished to be signed up to the newsletter for more information.

GROUNDWORK CHANGING PLACES CHANGING LIVES

WATFORD BOROUGH COUNCIL


Rediscovering the River Colne
WATFORD BOROUGH COUNCIL
BE BOLD
Lairage Land
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Oxhey Park
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Waterfields recreation ground
Timberlake allotments
Knutsford playing fields
Bushey Station
Radlett Road playing fields
Affinity Water land

Pollution

Pollution

Changes River's Natural Flow & Level

GROUNDWORK
CHANGING PLACES CHANGING LIVES

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Changes River's Natural Flow & Level

WATFORD BOROUGH COUNCIL

Physical Modifications

Physical Modifications

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Non Native Invasive Species

GROUNDWORK
CHANGING PLACES CHANGING LIVES

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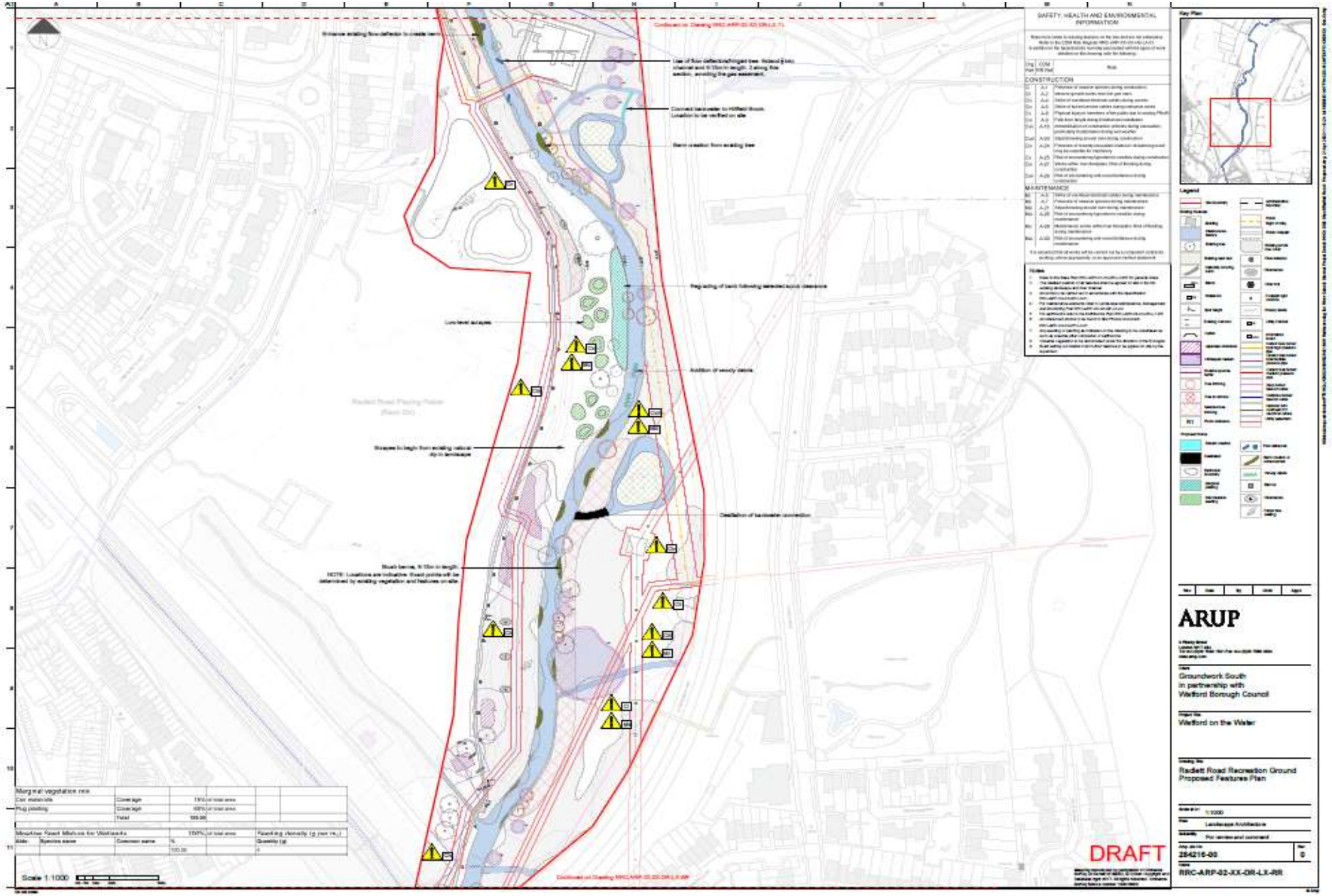
Current Project Stage: Design Phase




River is open and showing good signs of recovery
River is slow flowing and prone to siltation
River choked where its profile is open and wide
Good habitat structure but increased shade as river progresses south.
Affinity Water's site offers grassland of varying quality
River is open & fast flowing as it enters the site

Knutsford Playing Fields

Legend

- Site boundary
- Administrative boundary

Existing Features

- Building
- Public footpath
- Watercourse feature
- BT overhead cable
- Ditch outer limits
- Cadent Gas buried local high pressure pipe
- Existing tree
- Utility easement
- Japanese knotweed
- Existing contours
- Himalayan balsam
- Existing scrub/ tree cover
- Invasive species buffer
- Outfall
- Tree thinning
- Selected tree thinning
- Tree to remove
- KN1 — Photo reference
- Existing fencing

Proposed Works

- Earthwork boundary
- Flow deflector (Phase 1)
- Shrub planting
- Proposed tree
- Wet meadow seeding
- Bat box
- New fence line

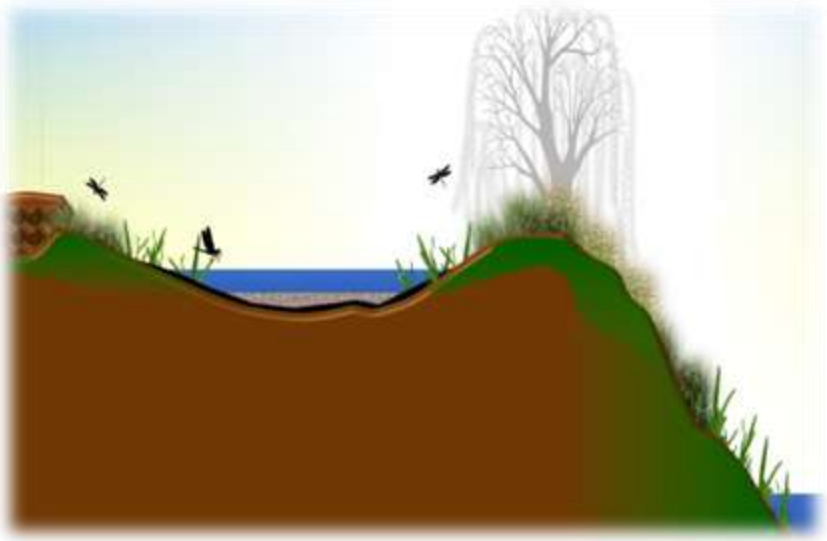
GROUNDWORK CHANGING PLACES CHANGING LIVES

WATFORD BOROUGH COUNCIL

Knutsford Playing Fields

Issue: The floodplain is disconnected from the main river connection with its natural flood plain.

Issue: The flood plain lacks natural wetland features.

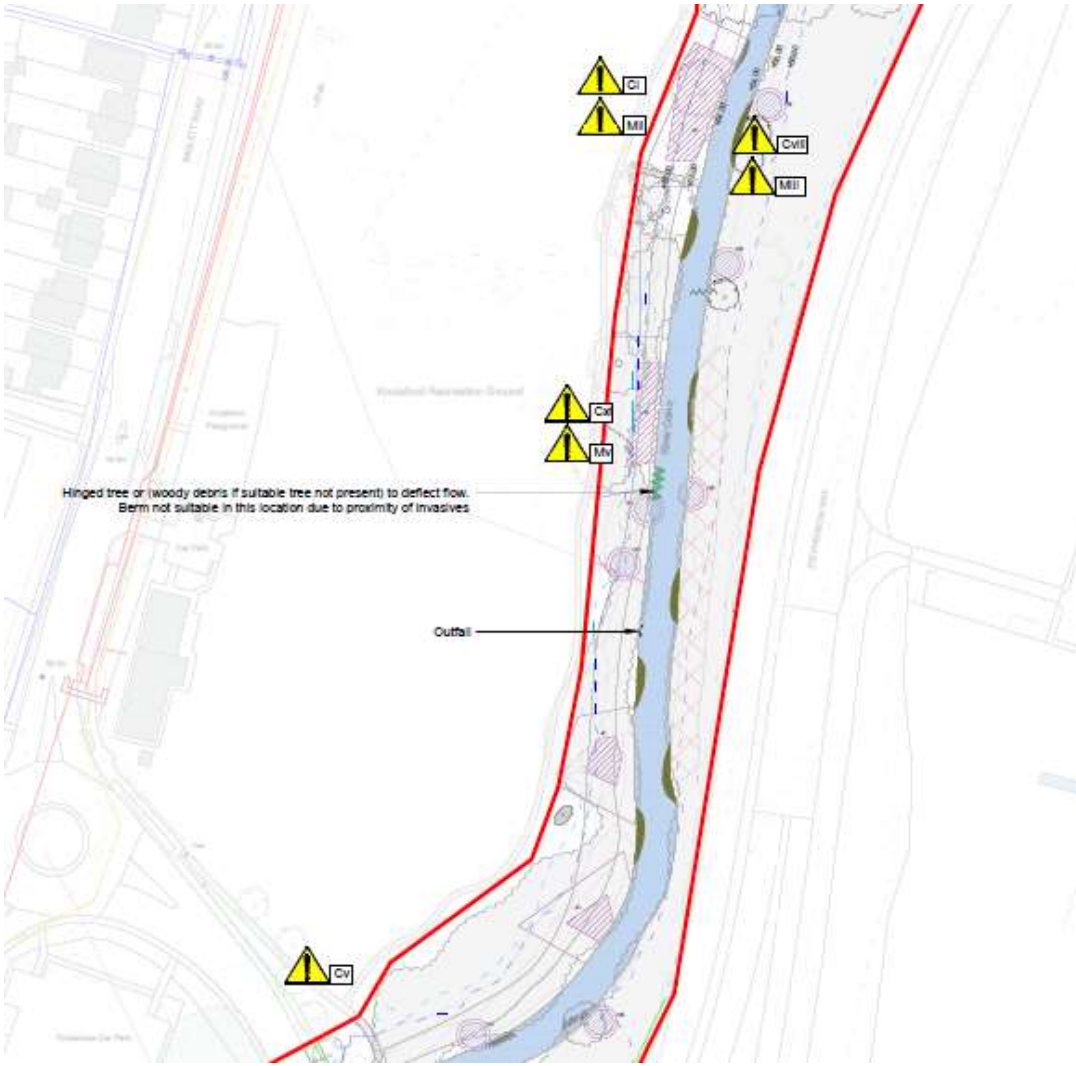


Solution: Installation of wetland scrapes with gently sloping edges that hold water providing valuable habitat for a range of wildlife and can be created in areas of damp grassland and floodplain.

GROUNDWORK
CHANGING PLACES CHANGING LIVES

WATFORD BOROUGH COUNCIL

Knutsford Playing Fields



Legend

Site boundary

Administrative boundary

Existing Features

Building

BT overhead cable

Public footpath

Utility easement

Watercourse feature

Woody debris hibernacula

Ditch outer limits

Existing contours

Existing tree

Existing scrub/ tree cover

Spot height

Bench

Japanese knotweed

Waste bin

Himalayan balsam

Footpath light columns

Invasive species buffer

Utility Cabinet

Naturally occuring berm

Information board

Selected tree thinning

Outfall

KS1 Photo reference

Proposed Works

Berm creation or enhancement

Woody debris

Marginal planting

Bat box

Hibernacula

GROUNDWORK CHANGING PLACES CHANGING LIVES

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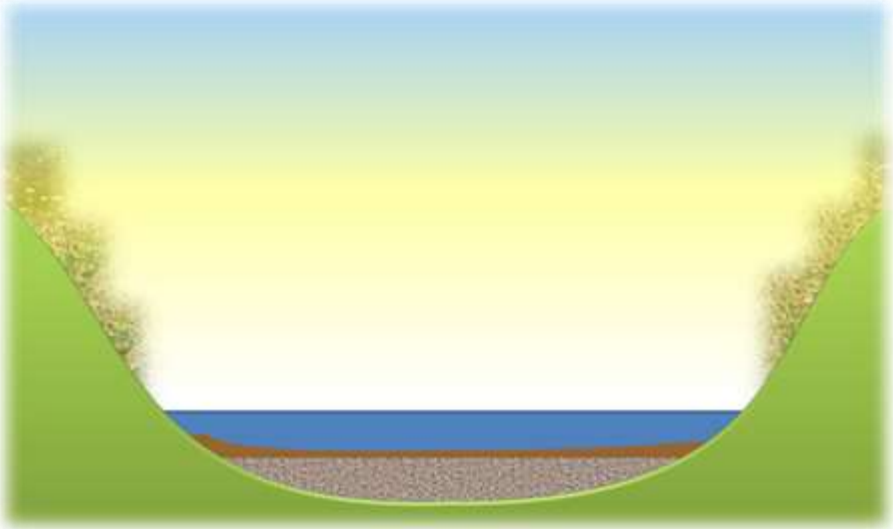
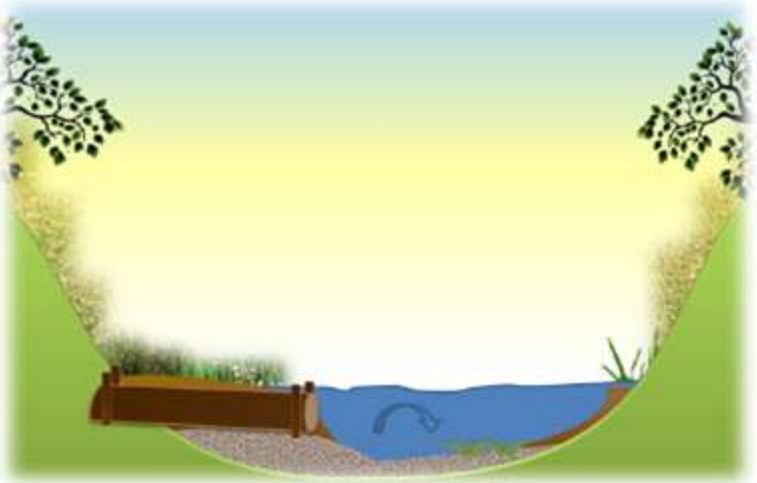
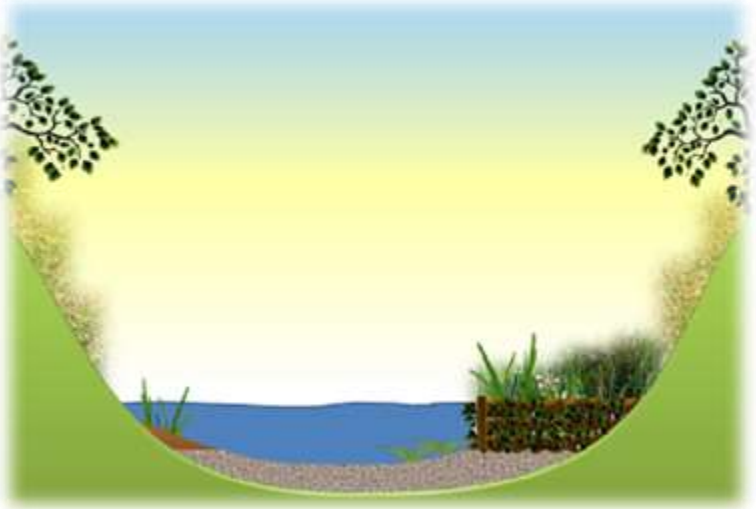
Knutsford Playing Fields

Issue: straight uniform channel which is heavily shaded and lacks flow diversity and diverse flora.

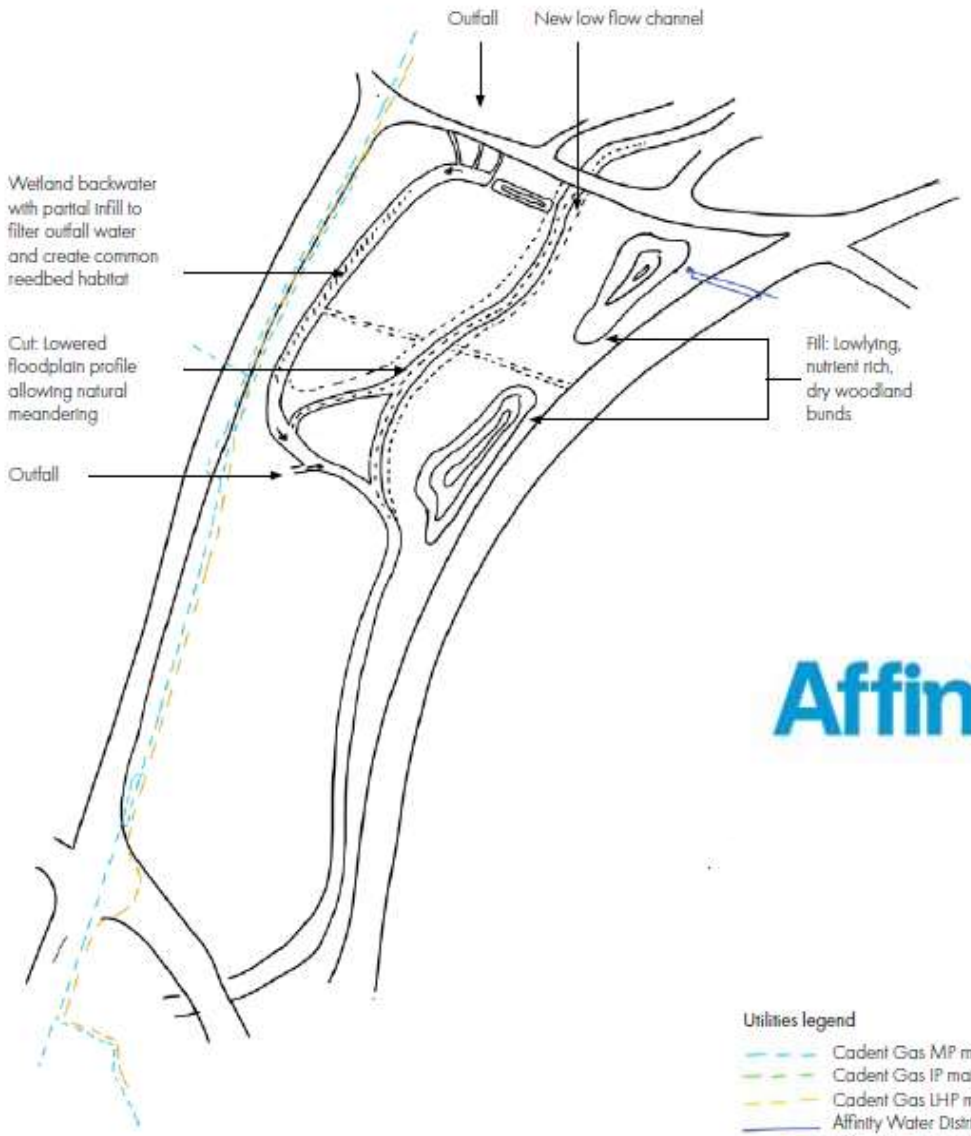


Solution: Flow deflectors and brush berms , reducing siltation, narrowing rivers and increasing flow diversity.





Knutsford Playing Fields – Meander Design



Affinity Water

Utilities legend

- Cadent Gas MP mains
- Cadent Gas IP mains gas
- Cadent Gas LHP mains gas
- Affinity Water Distribution Main
- Affinity Water Hydrant

GROUNDWORK CHANGING PLACES CHANGING LIVES

WATFORD BOROUGH COUNCIL

Knutsford Playing Fields

- A) Meander the river at the upper reach of Knustford connecting the floodplain to form a sinuous channel
- B) Partially backfilling the original channel creating a reedbed in the channel
- Significant benefits would be seen in:
  - Water quality
  - Water flow
  - Water storage and flood alleviation
  - Ecological benefits
  - The UK BAP priority habitat with reedbed of Phragmites australis would filter the water flowing from the outfall before it joins the main channel

Coming Next: Build Phases

River improvements – Benefits

- Backwater enhancements providing vital wet habitat enhancing biodiversity of riparian and terrestrial flora and fauna.
- Increased flood storage capacity and flood alleviation.
- Enhanced riparian and terrestrial habitat diversity.
- Increased resilience to pollution entering river corridor.
- Re-naturalised river corridor, increasing flow diversity and bring back natural morphology features.
- Opportunities for river access and public engagement e.g. berm installation.

GROUNDWORK
CHANGING PLACES CHANGING LIVES

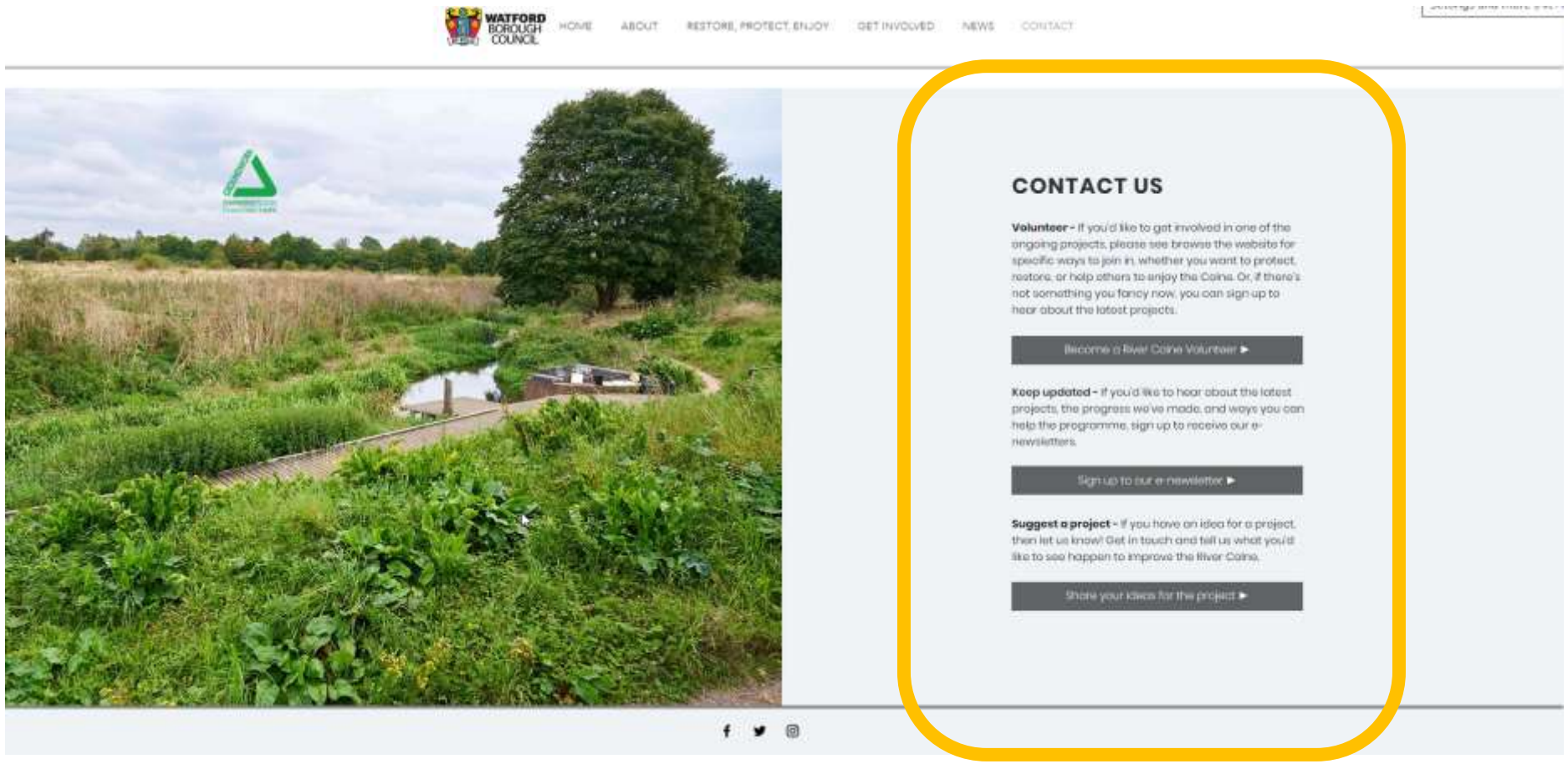
BE BOLD
WATFORD BOROUGH COUNCIL

What's next…

- Design and permitting for the Southern sites
- Consideration of feasibility study for a constructed wetland at Radlett Road
- Implementation of Northern site in river improvements
- Continued engagement, events and activities
- Volunteer recruitment and action – Citizen Scientists
- Environmental monitoring
- Continued development of the water quality forum
- Shaping and delivery of corporate volunteering/engagement
- Shaping future landscape and access improvements
- Developing management plans
- Developing a 'friends' group
- Fundraising – NHLF bid outcome

GROUNDWORK
CHANGING PLACES CHANGING LIVES

WATFORD BOROUGH COUNCIL
BE BOLD

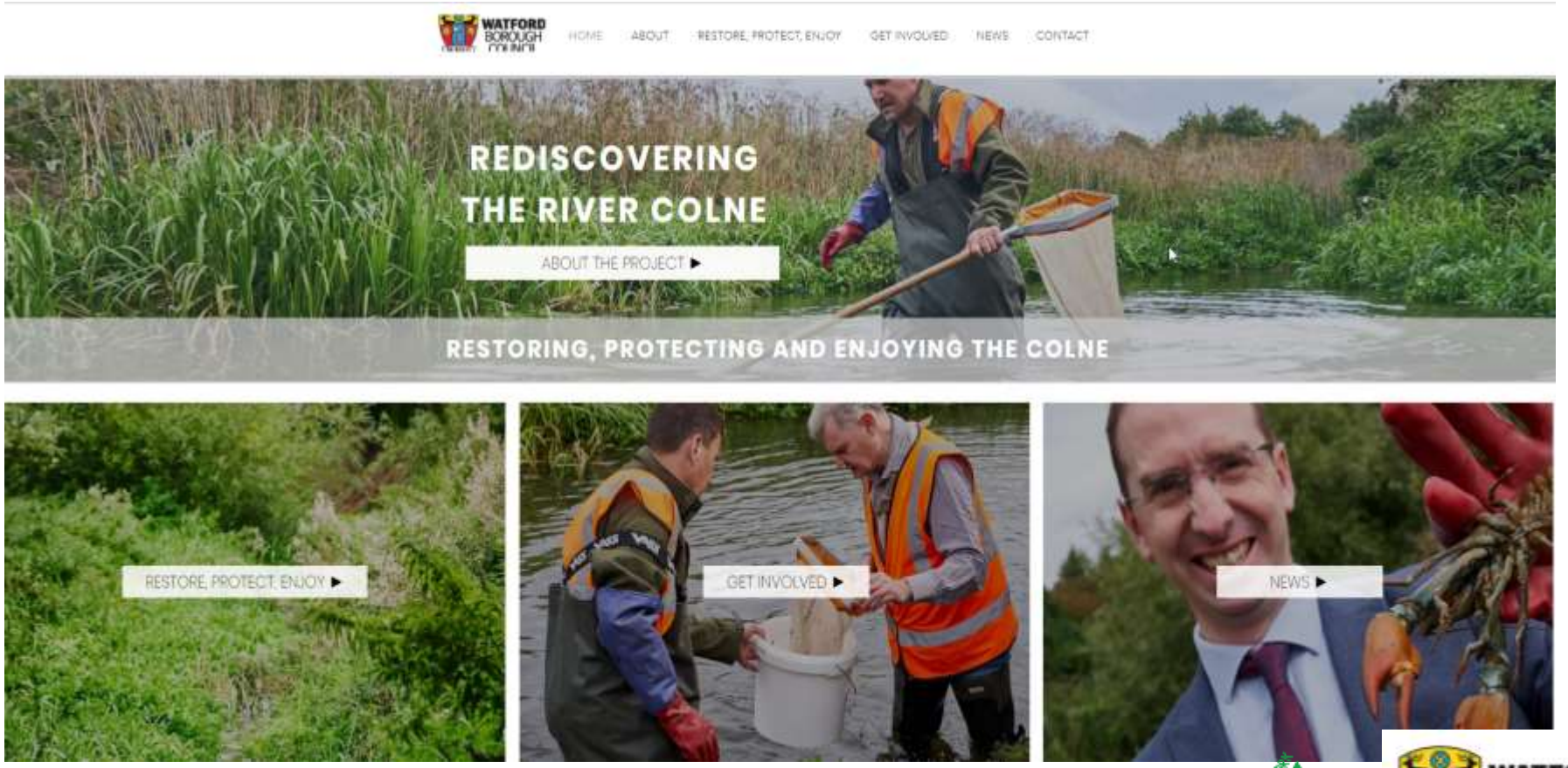


GROUNDWORK
CHANGING PLACES CHANGING LIVES

WATFORD BOROUGH COUNCIL
BE BOLD

For updates and information follow the website and social media feeds

[Home | Rediscovering River Colne (rivercolnewatford.co.uk)](https://rivercolnewatford.co.uk)



WATFORD BOROUGH COUNCIL

QUESTIONS

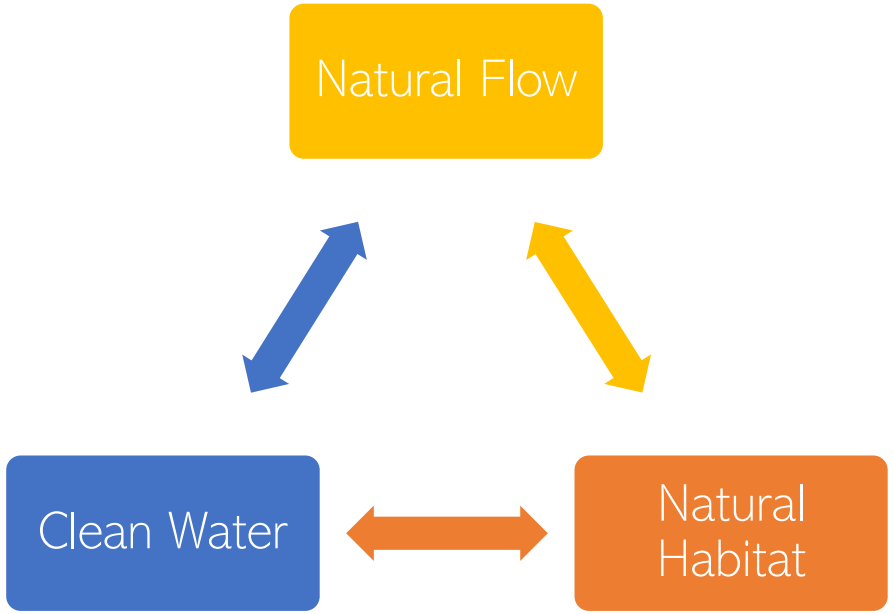
River Chess 'Smarter Water Catchments' Project

Helena Soteriou

Catchment Initiatives Programme Manager, Thames Water

Working in partnership

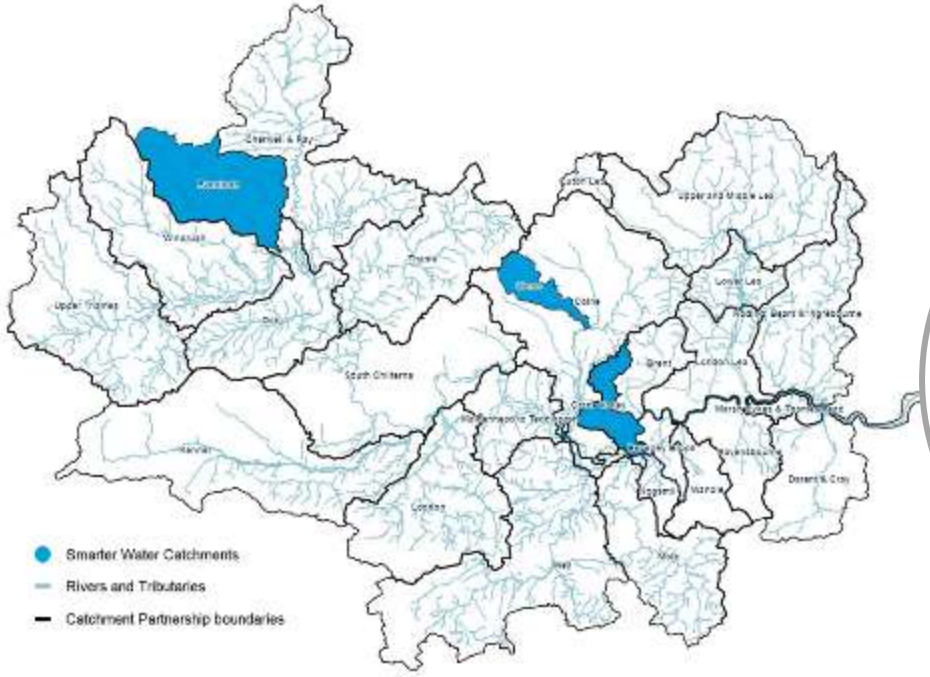
How do we improve the health of Chalk Streams?



Catchment Based Approach

What is the ‘smarter water catchment’ initiative?

A Thames Water pilot project looking at the environment as a system and working in closer partnerships to co-create & co-deliver innovative solutions to our greatest challenges



Additional **£9m** investment from 2020-2025 to trial new ways of working to improve the health of our river catchments

- Develop deeper understanding of the challenges
- Determine requirements to facilitate co-delivery
- Explore co-funding opportunities
- Set a precedent for future ways of working across the water industry
- Inform better decision making & future investment

What does this mean in practice?

We have co-created a shared 10-year plan which aims to restore the health of the River Chess

Our ways of working

We have established new governance to drive forward the delivery of our plan

Project Management

River Chess Association (RCA) & Chilterns Conservation Board (CCB), Thames Water (TW)

Steering Group

Chairs: River Chess Association & Chilterns Conservation Board
Members: Sarratt Parish Council; Thames Water; Environment Agency; Herts & Middlesex Wildlife Trust; Buckinghamshire Council; Chilterns Society; Affinity Water

Working Groups

Control of non-native Invasive Species
Nominated lead: CCB
Group members: RCA, TW

Involving People
Nominated lead: Tom Beeston
Deputy: Simon Diggins
Group members:
CCB, RCA, Sarratt PC, Affinity Water, Buckinghamshire Council, Chilterns Society, TW

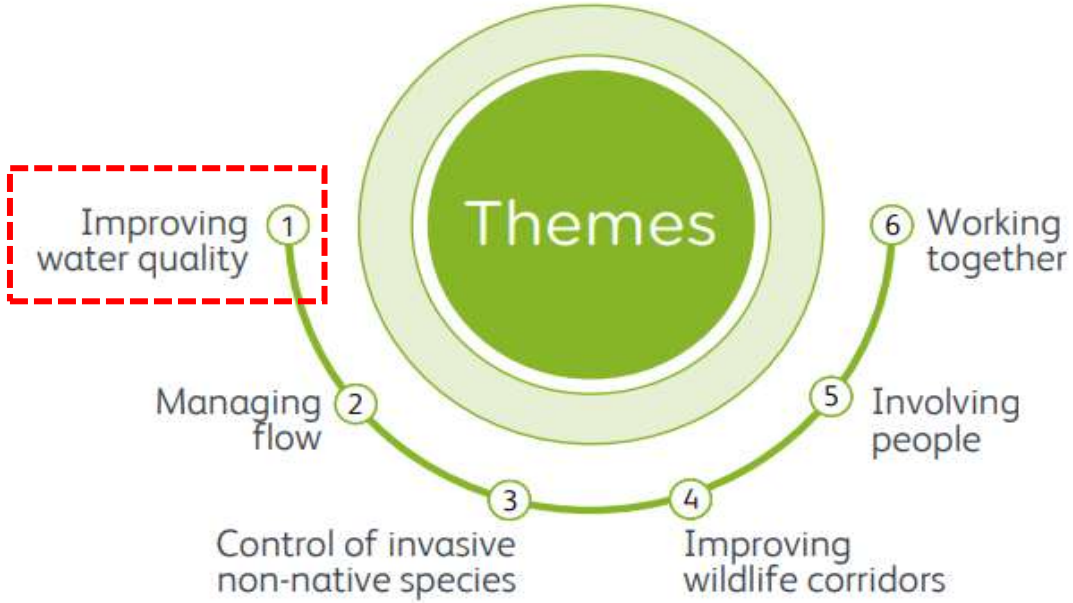
Wildlife Corridors
Nominated lead: CCB
Group members:
Mott MacDonald, HMWT, NE, Forestry Commission, RCA, Hertfordshire County Council, Buckinghamshire Council, TW

Working Together
Nominated lead: Simon Diggins
Deputy: Tom Beeston
Group members:
CCB, RCA, Sarratt PC, TW

Water Quality
Nominated lead: CCB WQ secondment
Group members: CCB, Buckinghamshire Council, TW, EA

Managing Flow
Nominated lead: RCA
Group members: Affinity Water, TW, Buckinghamshire Council, EA

Progress so far



You can watch the videos from our workshop and see what else we have been up to in the catchment: (i) water quality & managing flows (ii) INNS and Wildlife Corridors (iii) Working together and people

Improving water quality

Kate Heppell

Queen Mary University of London

Chilterns Chalk Streams Project

Working in partnership

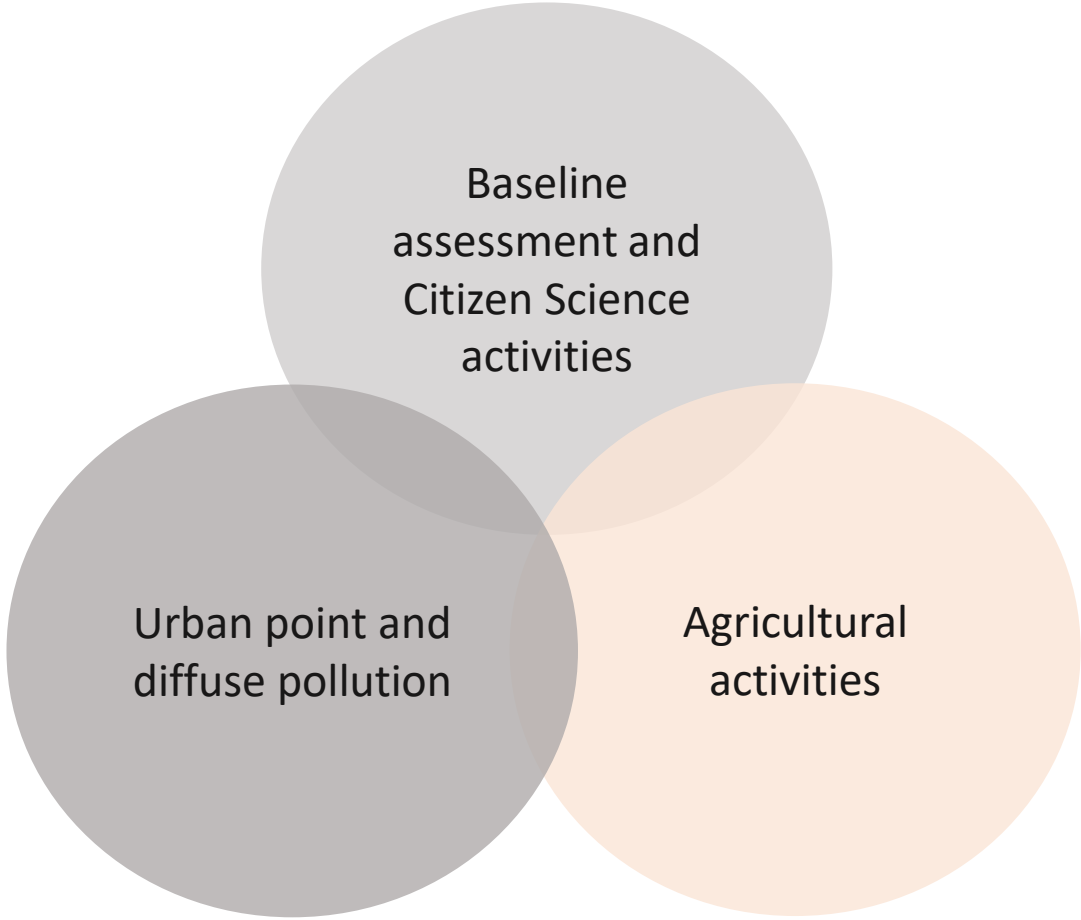
Water quality activities

Over the last year Chilterns Chalk Streams Project has been:-

- Monitoring the River Chess with the ChessWatch initiative
- Carrying out an assessment of monitoring activities and water quality in the River Chess
- Developing plans for new Citizen Science activities in the River Chess

Over the last year Buckinghamshire Council with Jacobs have been:-

- Collating information and data, and developing an action plan for urban runoff in Chesham



ChessWatch

- Installed real-time water quality sensors at four locations in the river Chess in 2019
- These sensors record different aspects of water quality every 15 mins

  Dissolved oxygen

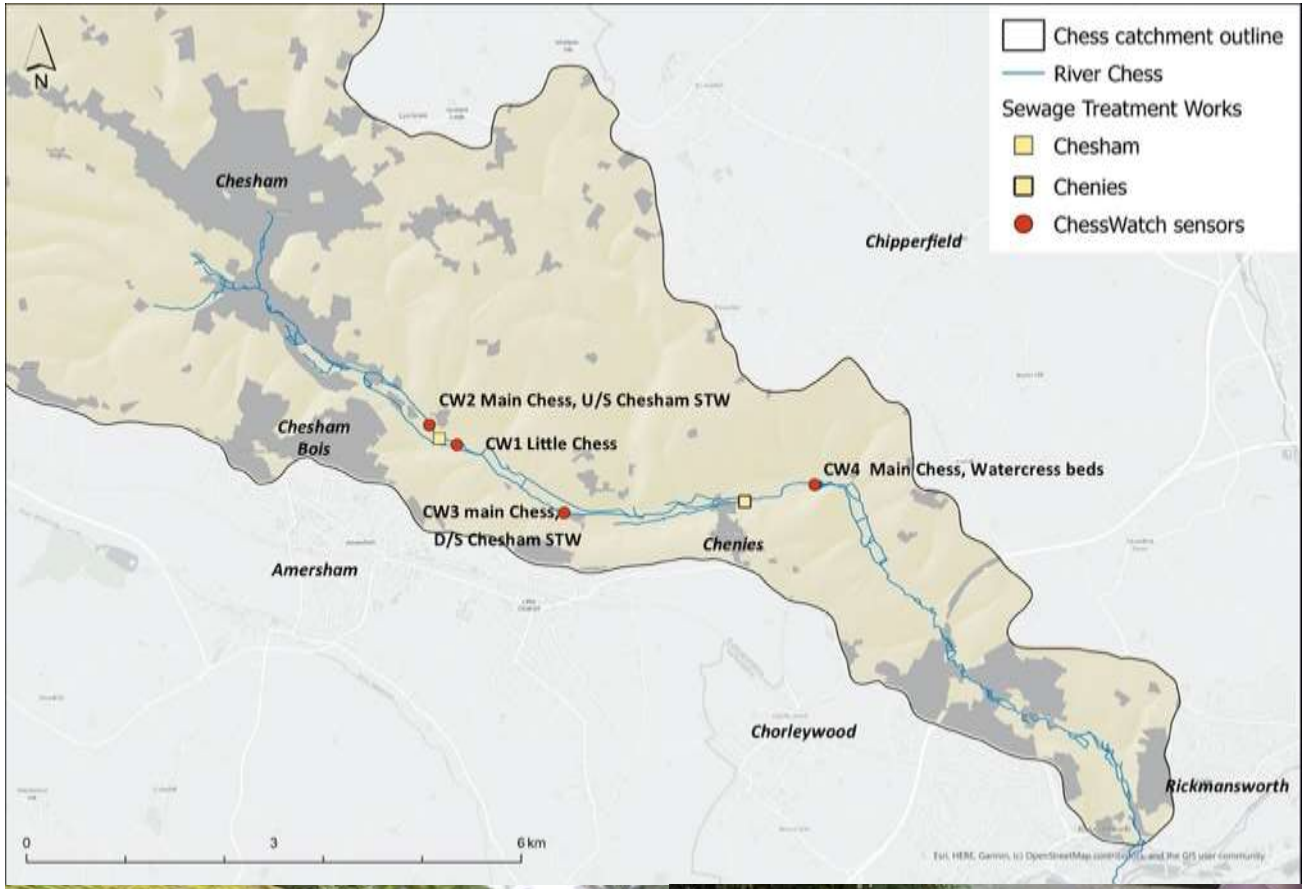
  Water temperature

  Electrical conductivity

  pH

  Turbidity

- Maintained by Sensor Guardians plus Queen Mary University of London (QMUL)
- Have won a QMUL Impact Award for working together



River Chess Storymap

Information about the river and water quality dashboard at http://chess-observatory.qmul.ac.uk

COLLECTION

River Chess

Exploring the Chess as an environmental system and presenting realtime dashboards

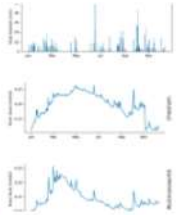
Get started

1. The River Chess

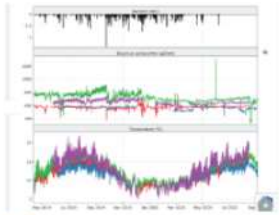
2. The River Chess catchment and beyond

3. Three Stretches of the Chess

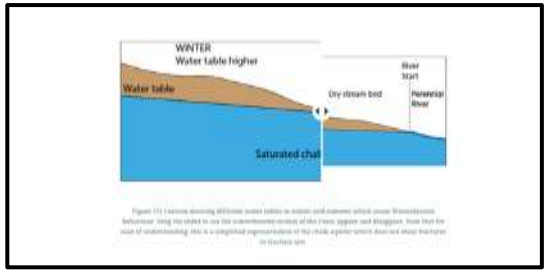
4. What can you do?



5. River Chess Hydrographs



6. Water Quality Dashboard



Natural Environment Research Council

Water quality dashboard in River Chess Storymap

Select which variables you want to plot, and click "Update plots" to refresh the plots. The plots may take a few seconds to load.

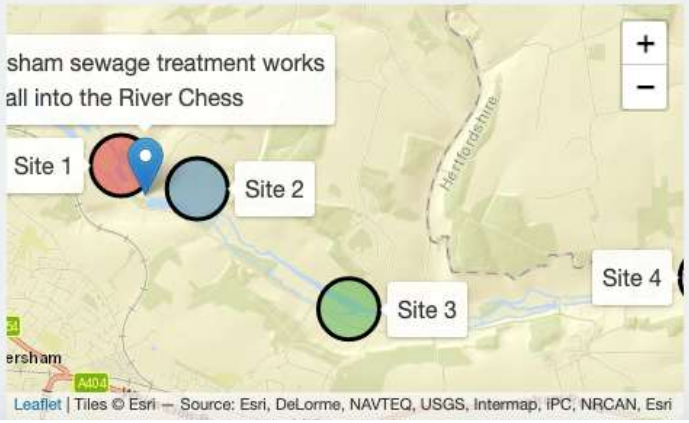
Choose measurements:

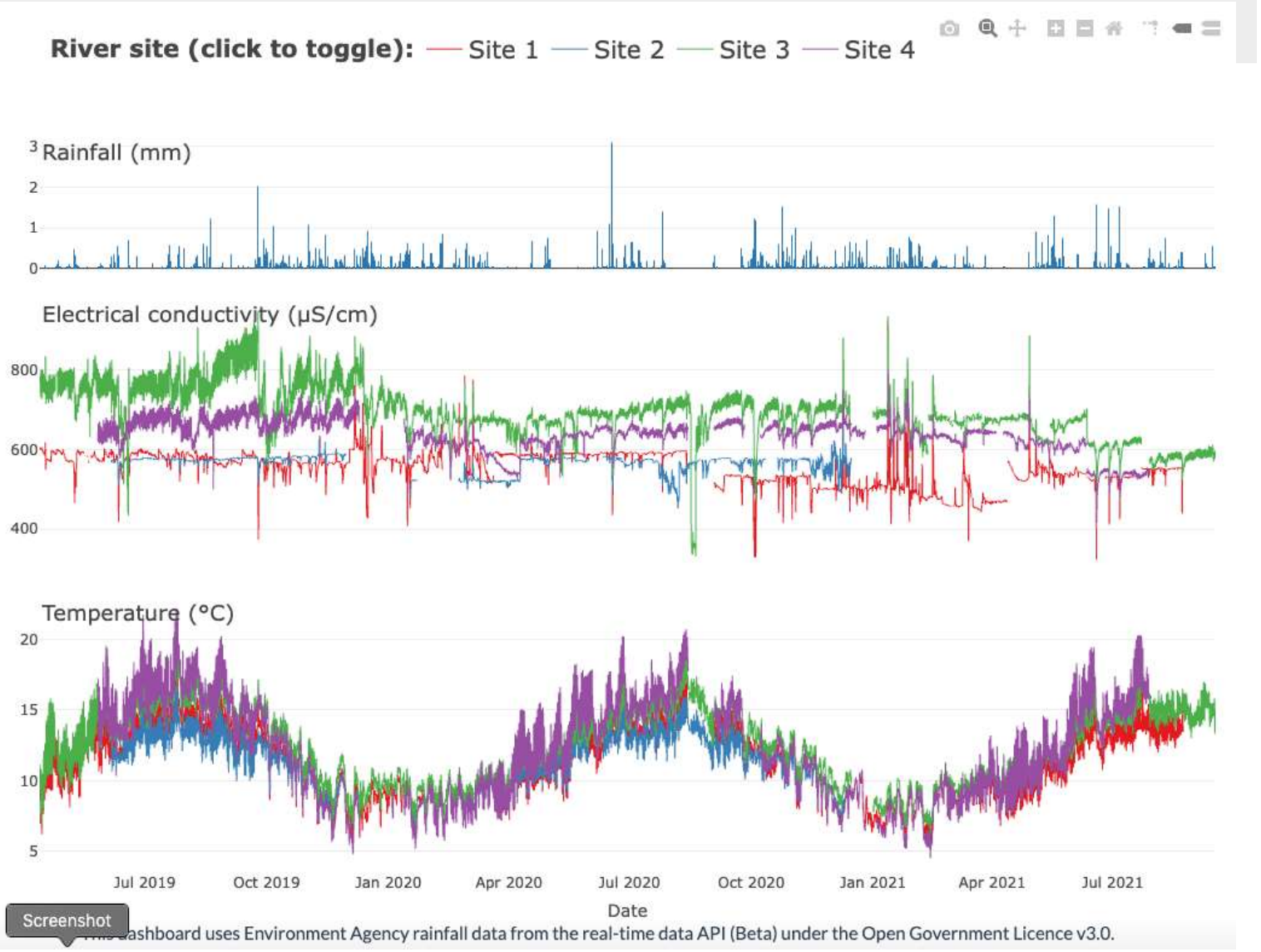
- [ ] Dissolved oxygen (% saturation)
- [ ] Dissolved oxygen (mg/L)
- [x] Electrical conductivity (µS/cm)
- [ ] pH
- [x] Temperature (°C)
- [ ] Tryptophan (RFU)
- [ ] Turbidity (NTU)
- [ ] Water level (m)

Select start and end dates:

Pick 2 dates

Cle Update plots [ ] Show events





Screenshot

This dashboard uses Environment Agency rainfall data from the real-time data API (Beta) under the Open Government Licence v3.0.

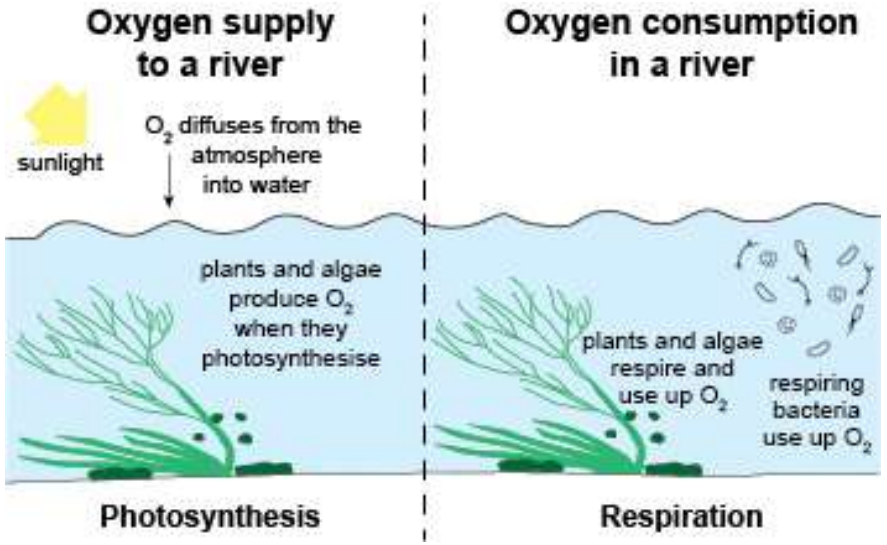
What is dissolved oxygen?

- Fish and aquatic organisms need oxygen (O_2) dissolved in the water to breathe.

- Oxygen levels in the river are a balance between oxygen supply (oxygen produced by photosynthesis) and oxygen demand (oxygen used by respiration of plants, animals and microbes).

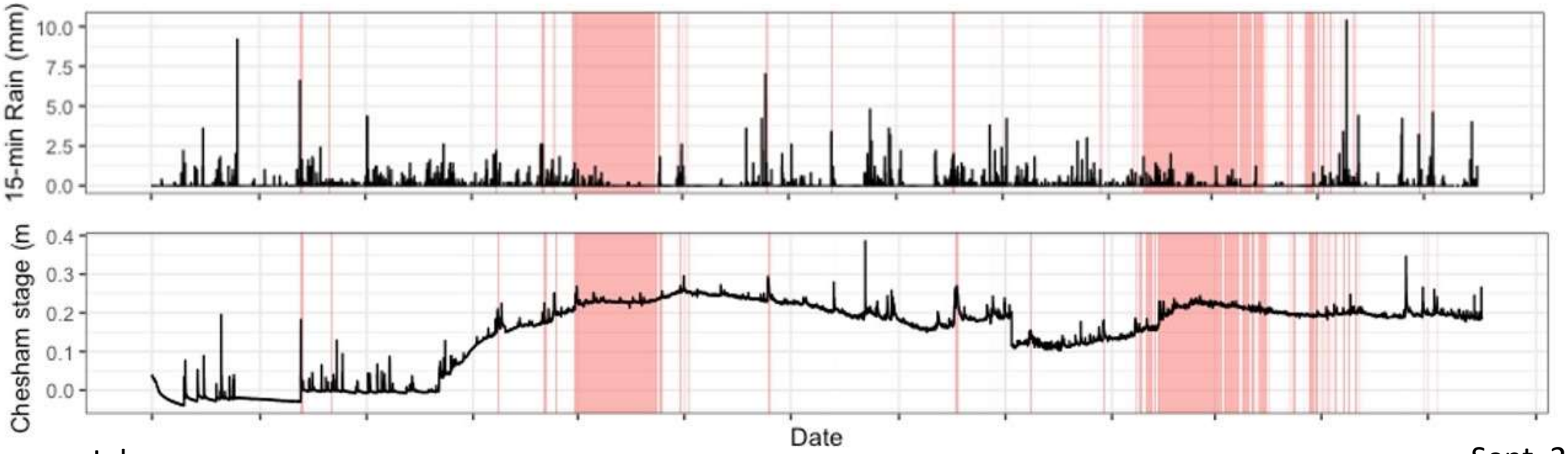
- Dissolved oxygen status of the River Chess is classified as 'High' on the basis of the Water Framework Directive assessment (> 80% as 10th percentile).

Oxygen in a river system



Storm tank overflows from Chesham WWTW

Peach panels show periods of storm tank overflow



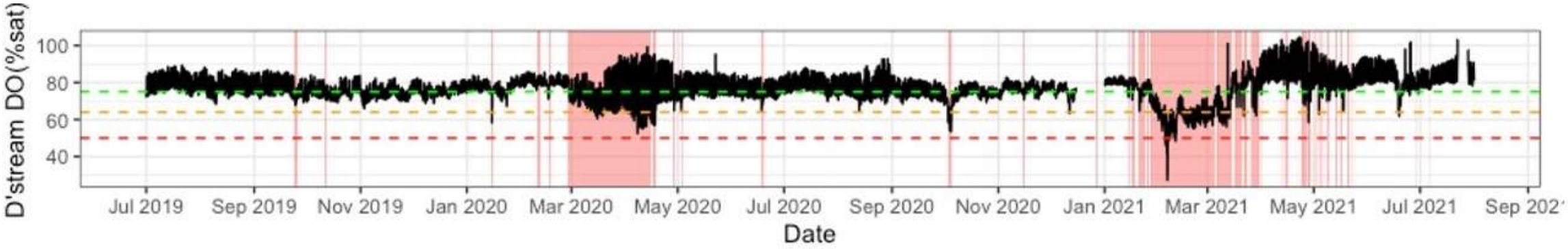
Storm tanks at Chesham WWTW can overflow when capacity of treatment works is exceeded, to prevent water backing up into homes. Over the last few years storm tank overflows have occurred from Chesham WWTW due to:

(i) intense rainfall;

(ii) groundwater ingress to sewer network when groundwater levels are high

The impact on dissolved oxygen downstream of Chesham WWTW

Peach panels show periods of storm tank overflow

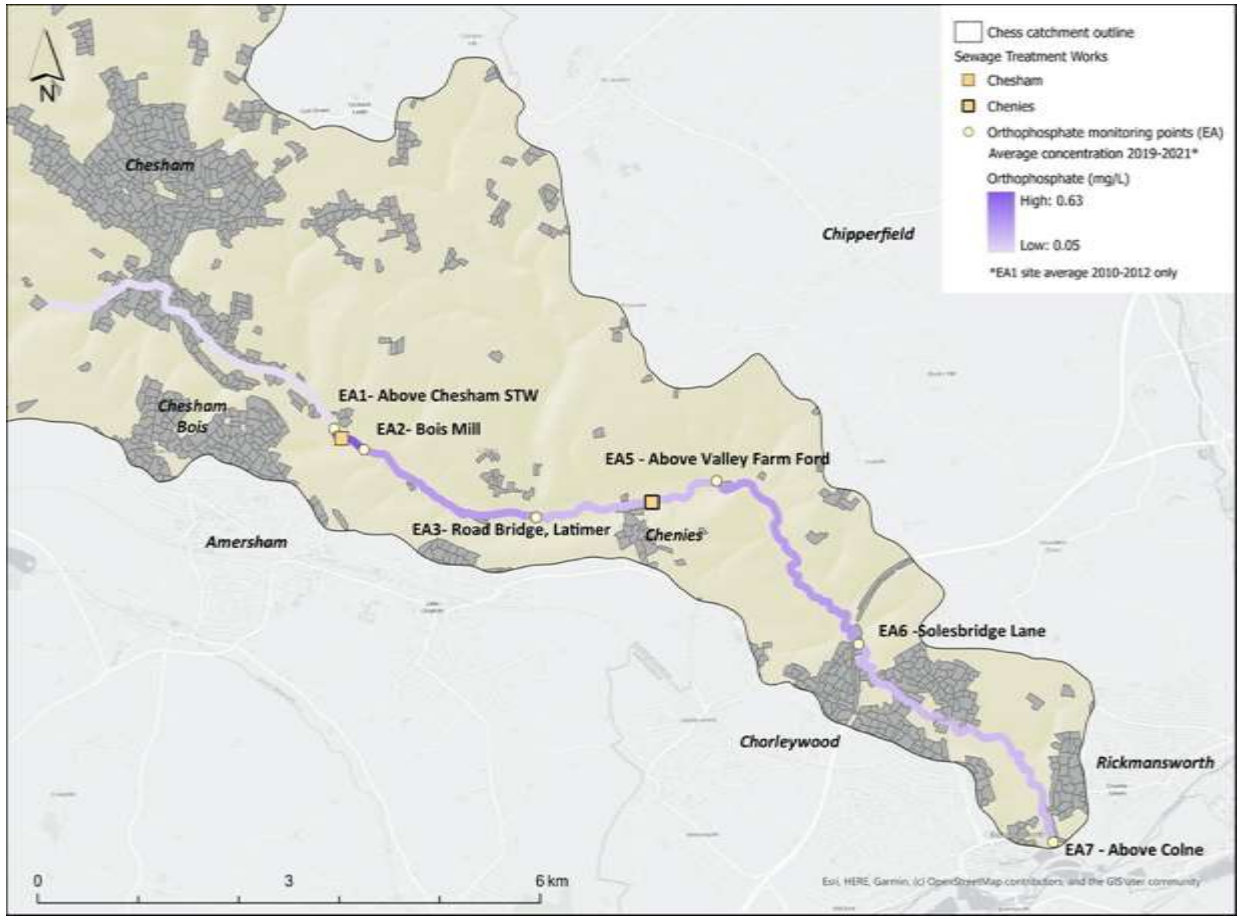


- Groundwater ingress causes dissolved oxygen levels in the water to drop downstream of Chesham WWTW for prolonged periods (days to months)
- Intense rainfall can cause transient drops in dissolved oxygen levels (hours)
- Dissolved oxygen levels further downstream (e.g. at Sarratt) remain high
- Levels of bacteria and viruses in the water due to storm tank discharges are not known

Total Reactive Phosphorus

- Phosphorus is an essential macronutrient that is fundamental to sustaining rivers.
- Natural sources of P from geology, soils and vegetation are being augmented by farming and wastewater.
- However, elevated P, along with elevated N, leads to eutrophication which is responsible for algal blooms and biodiversity loss.
- Phosphorus status of the River Chess is classified as ‘Poor’ on the basis of the Water Framework Directive assessment.

Spatial distribution of reactive phosphorus in the River Chess



Uses Environment Agency data

Investment in Chesham

Upgrades to Thames Water assets

Sewage Treatment Works Capacity Upgrade

- Optimised existing assets since April 2021 to reduce volumes discharged from storm tanks
- Upgrade the site to increase the capacity that can be treated by ~40% (end of 2023)

Sewage Treatment Works Quality Upgrade

- Upgrade the site to reduce the Phosphorus permit from 2mg/l to 0.25mg/l (end of 2024)

Reducing infiltration & improving the resilience of our network

- Undertaken CCTV on 4.6km of sewer to identify hotspots & priorities for repair
- Re-lined large sections & repaired defects
- Finding and correcting surface water to foul misconnections; sealing and replacing ~750 manholes (by Sept 2022)

Fine sediment

- Fine sediment infills gravels and prevents exchange of ground and surface water
- A coating of fine sediment smothers the riverbed, preventing fish from finding suitable areas to lay eggs, and aquatic plants from taking root
- Fine sediment carries pollutants such as metals and hydrocarbons from urban runoff
- Fine sediment lowers oxygen levels in the spaces between gravels preventing fish eggs from developing

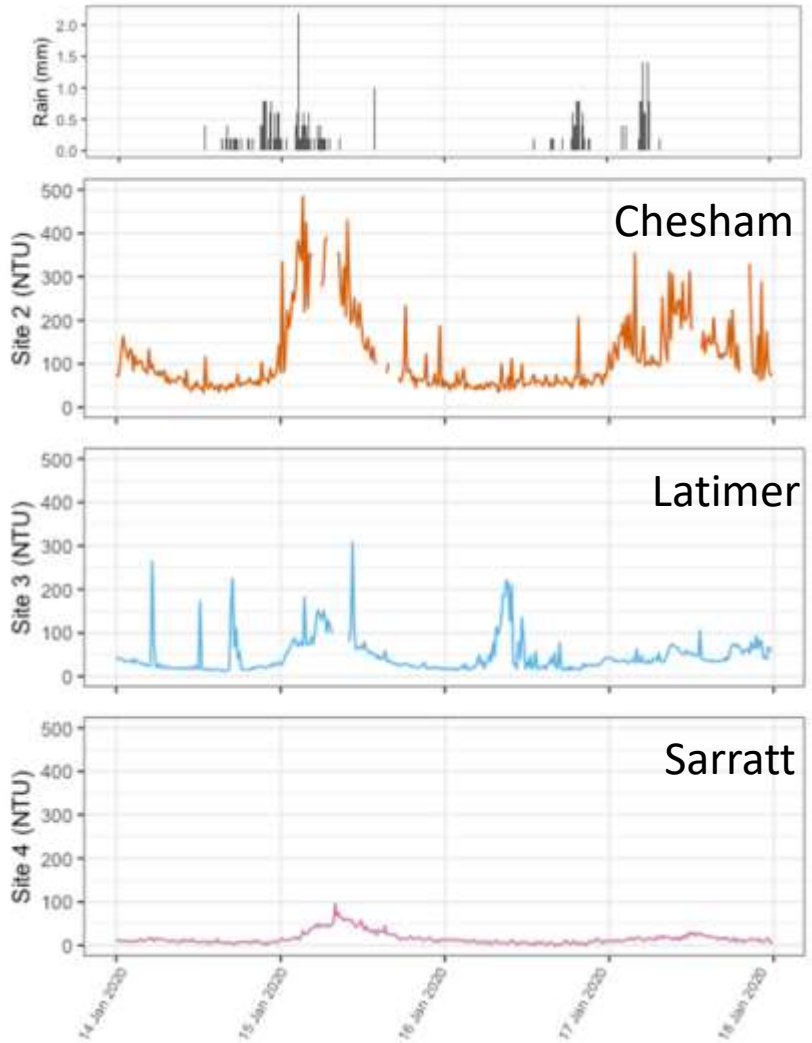
SOURCE: Chilterns Chalk Streams Project

SOURCE: River Chess Association

Fine sediment

- ChessWatch sensors measure the clarity of the river water (turbidity)
- Our measurements of turbidity suggest that there is more of an issue with fine sediment transport in the upper reaches of the Chess compared to the middle reaches
- The lower reaches are not yet monitored

SOURCE: River Chess Association



Risk mapping for sediment inputs

Using on-line version of SCIMAP

SCIMAP developed by University of Durham

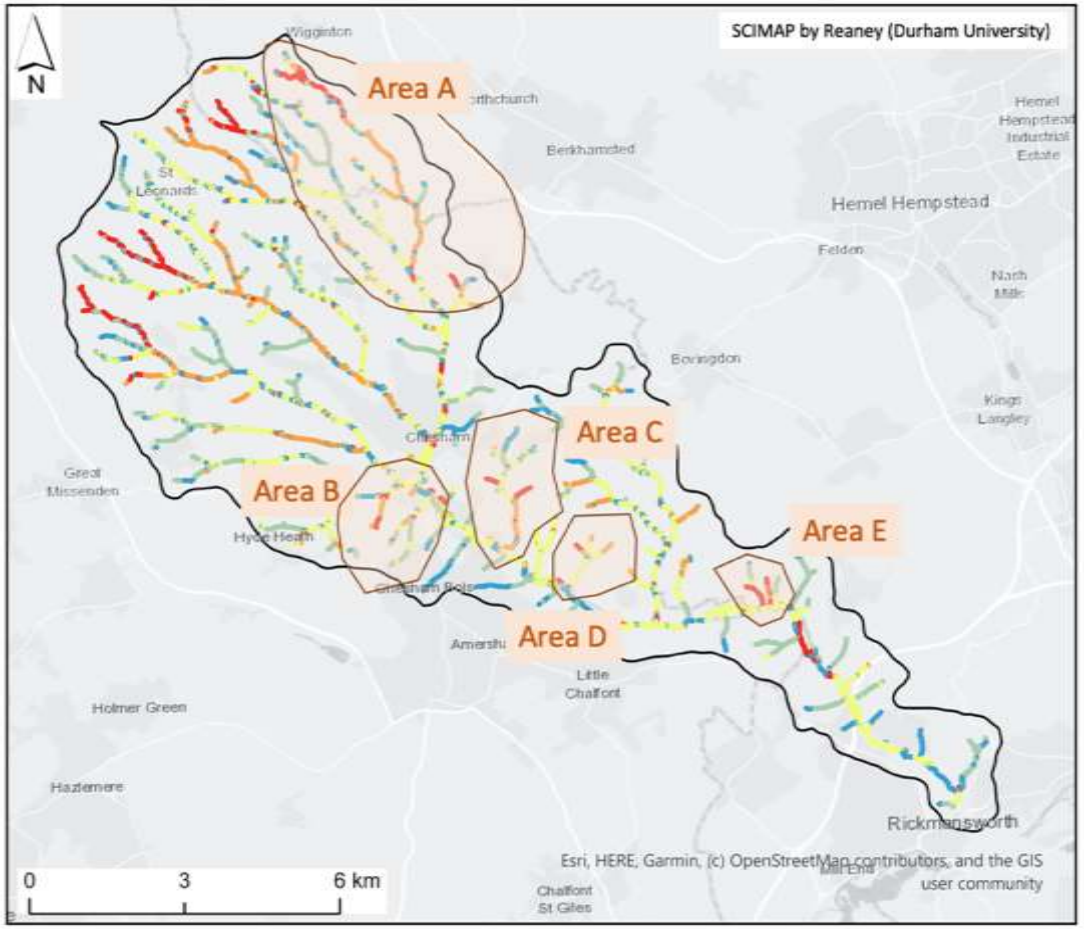
Used to identify areas at high risk of soil erosion on basis of land use and topography

Uses DEM to route sediment to river and identify locations of river at risk of receiving sediment input

Risk mapped relative to highest risk area for the catchment

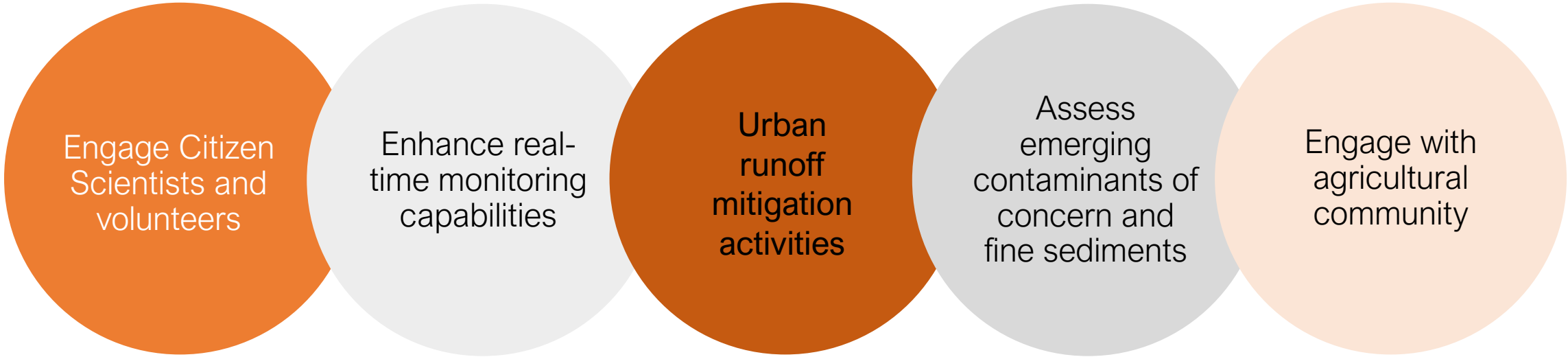
We are using this risk mapping in conjunction with observations from local stakeholders to prioritise areas for investigation

This is the theoretical risk e.g. does not include sediment transport via road network



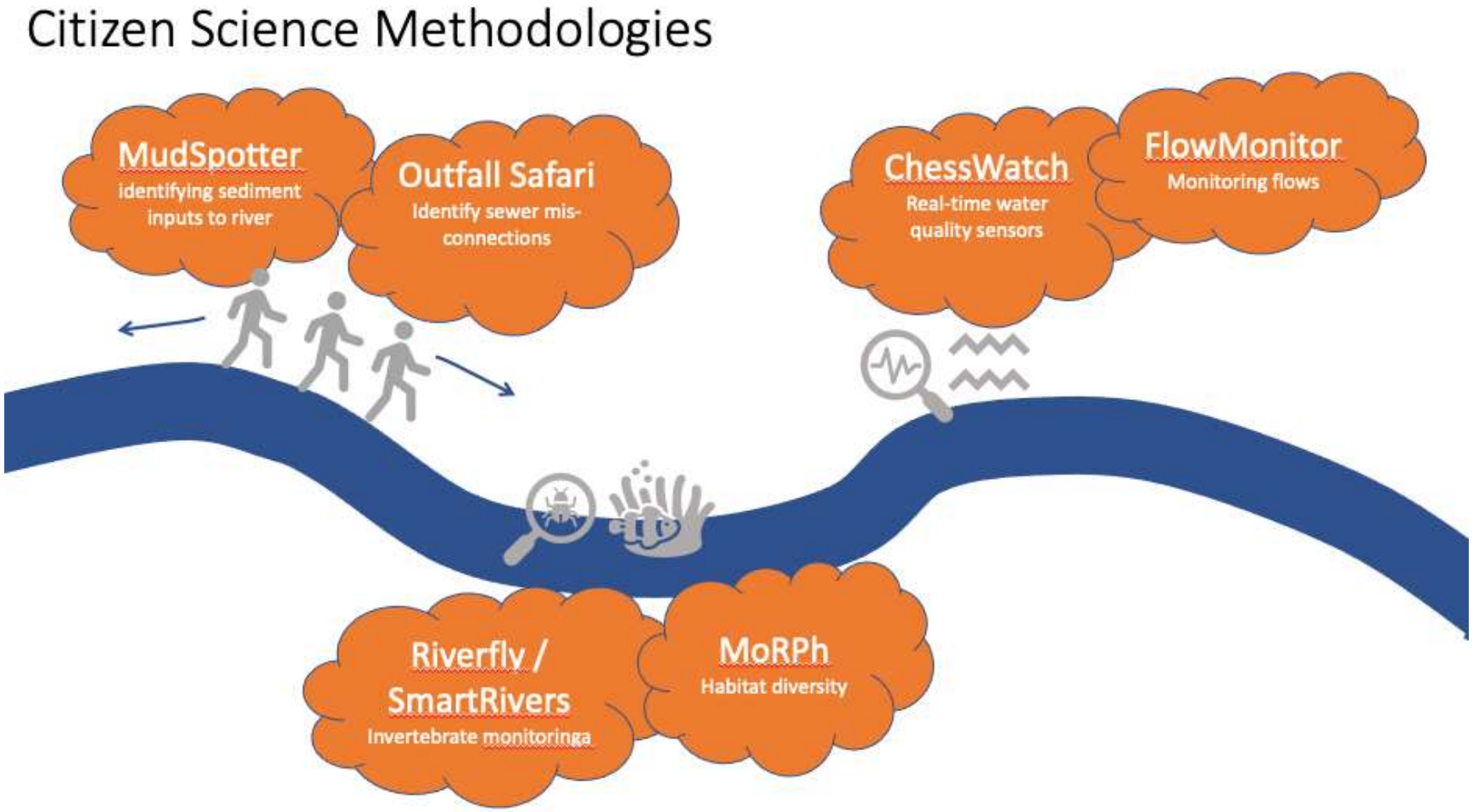
Next Steps

Year Two activities



Expanding Citizen Science activities

Current and future Citizen Science activities in the River Chess



MudSpotter

Designed as a riverbank survey to identify inputs of fine sediment to a river during wet periods

Under trial in the River Chess

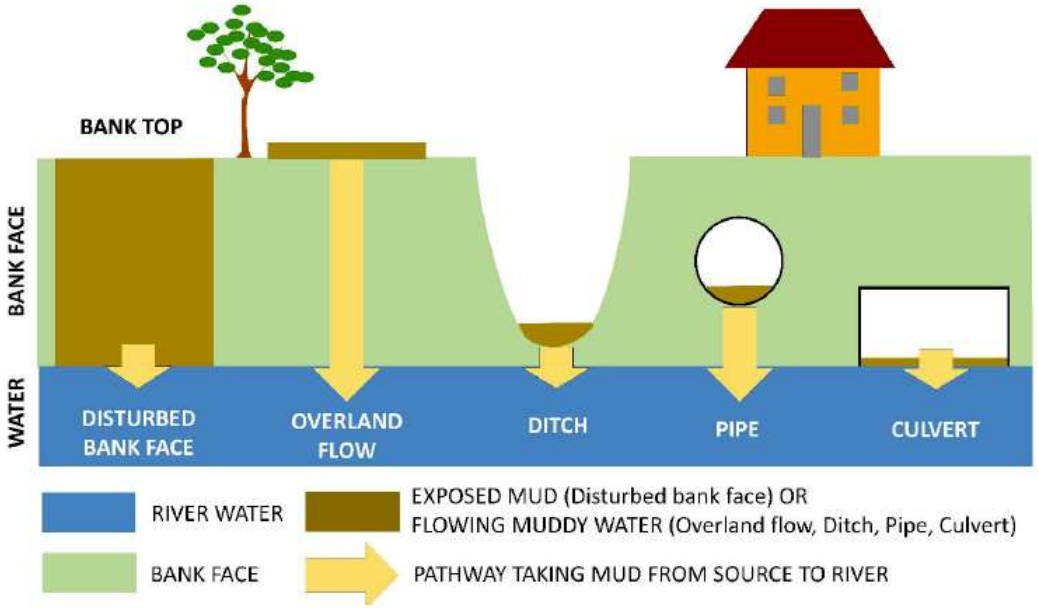


Figure 1: The five types of muddy water source recorded by Mud Spotter

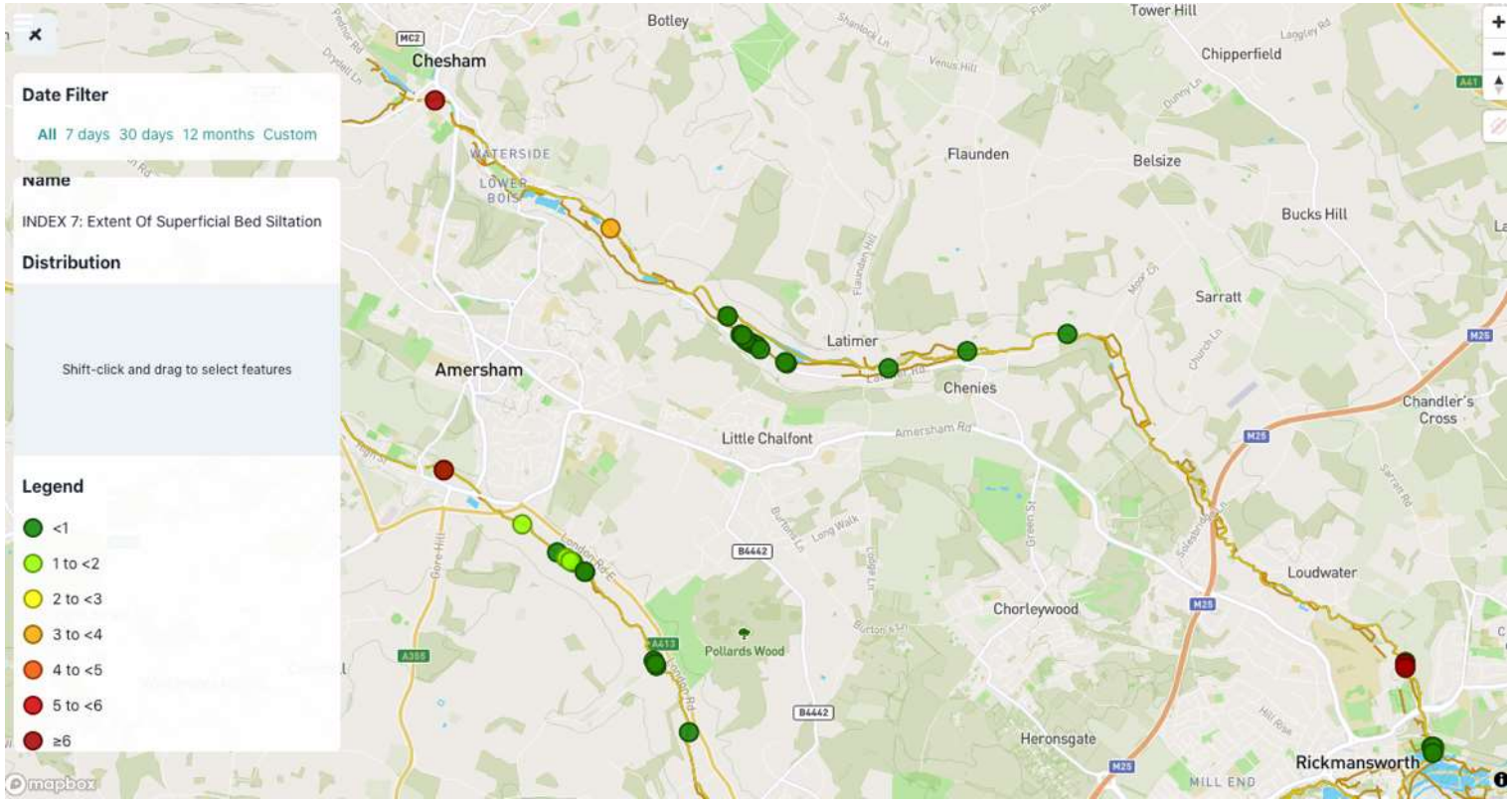
Modular River Survey

Modular River Survey

Assess the quality of physical habitat

Assess the function of the river system

Provides traffic-light ecological and hydro-morphological indicators for the river



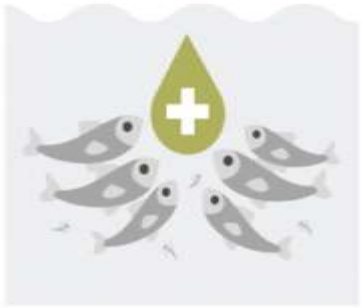
Indicator 7:
Extent of superficial bed siltation

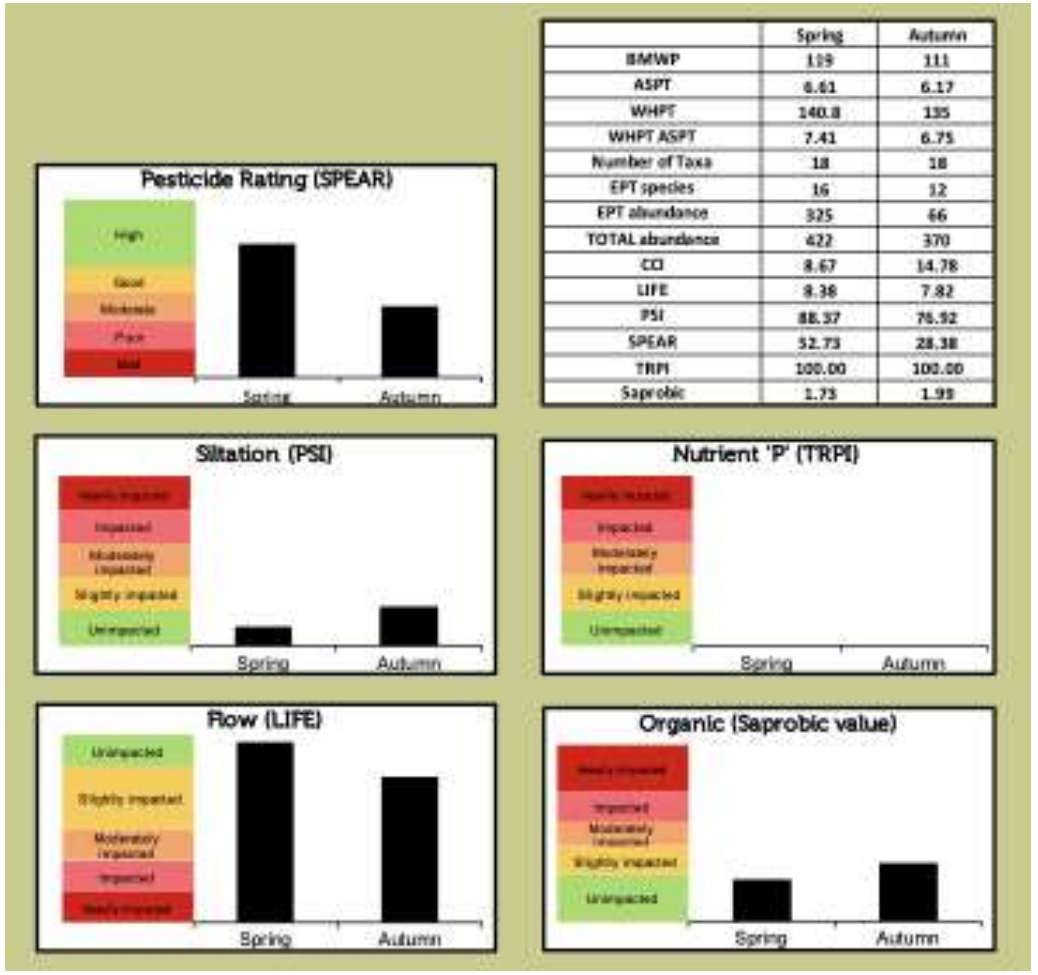
SmartRivers

Collect riverfly samples every 6 months

SmartRivers is designed to identify the nature of the impact on your river reach: *sediments, phosphorus, flow, chemicals, organic enrichment.*

This directed approach can then inform management initiatives.





	Spring	Autumn
BMWP	119	111
ASPT	6.61	6.17
WHPT	140.8	135
WHPT ASPT	7.41	6.75
Number of Taxa	18	18
EPT species	16	12
EPT abundance	325	66
TOTAL abundance	422	370
CCI	8.67	14.78
LIFE	8.38	7.82
PSI	88.37	76.92
SPEAR	52.73	28.38
TRPI	100.00	100.00
Saprobic	1.73	1.98

Example output for a river – not the Chess

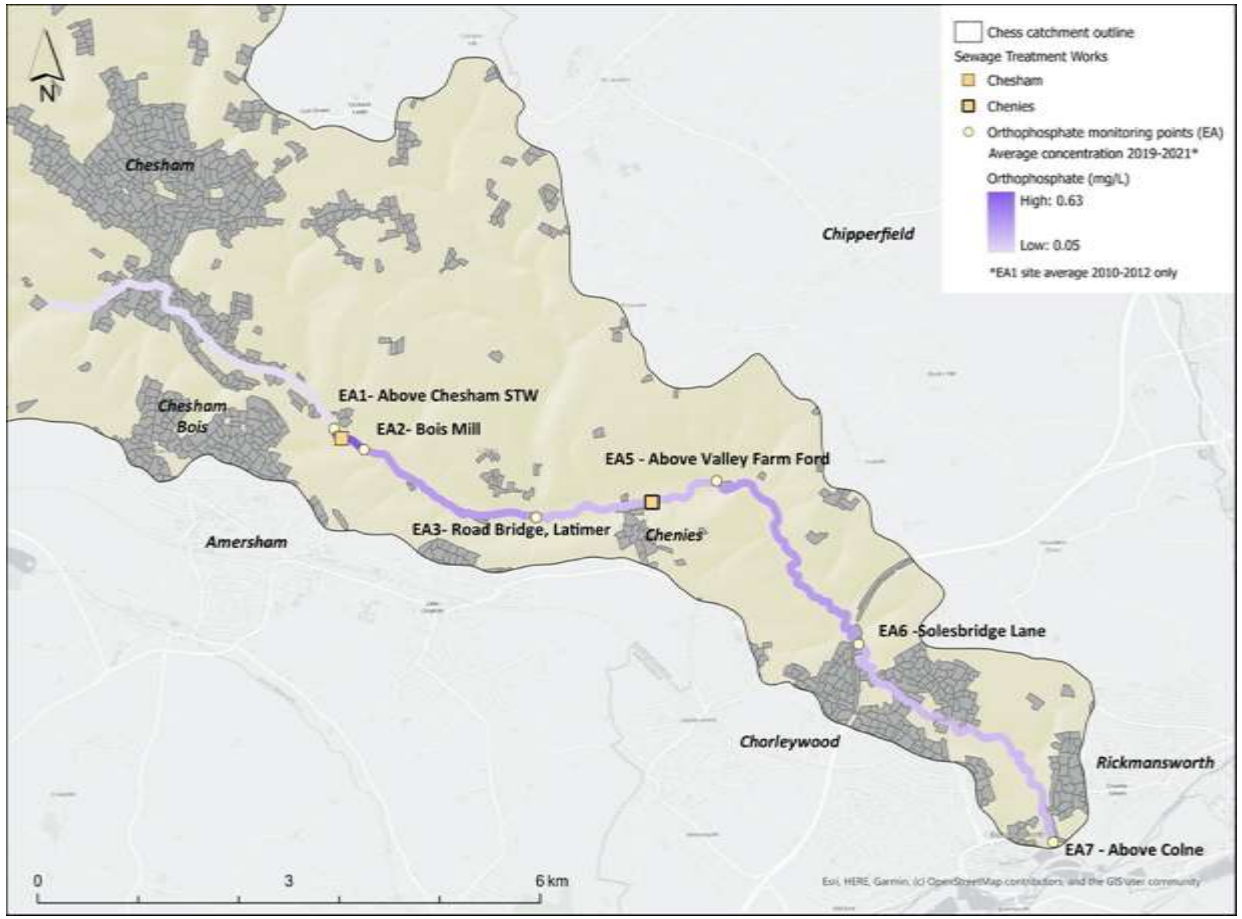
Water quality campaigns

Bespoke monitoring campaigns with field spectrophotometer

Measure phosphate and nitrate concentrations in different reaches of the River Chess with a Citizen Science team

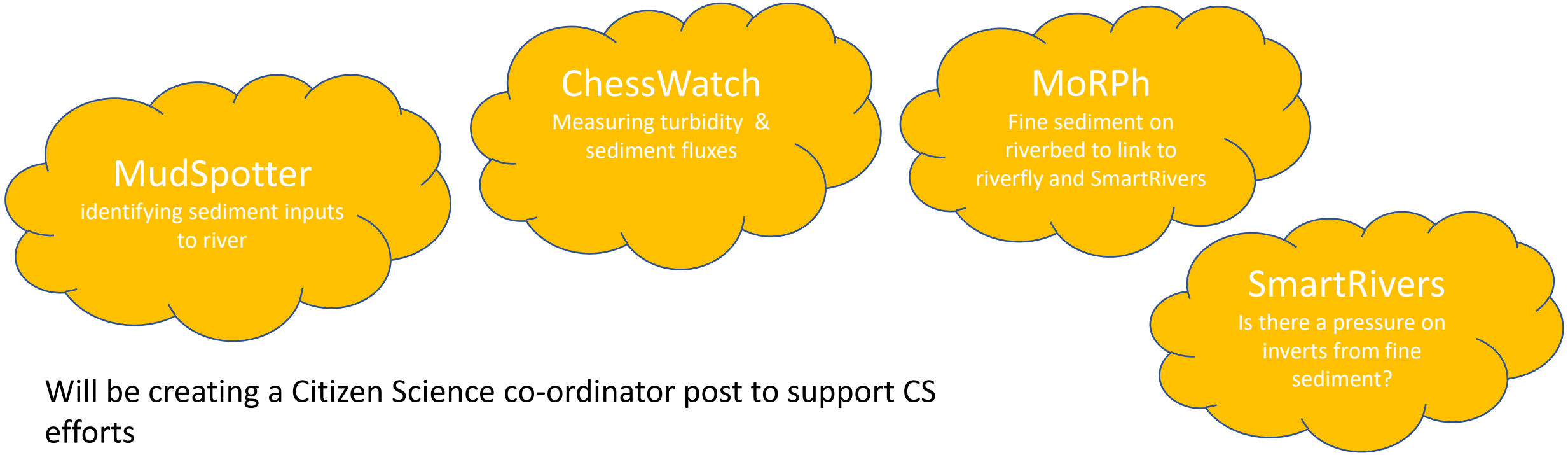
‘Blitz’ different reaches at appropriate spatial and temporal resolution

First focus will be lower reaches where we have less information about reasons for changes in phosphate and nitrate



CS activities to address fine sediment

River Chess



Will be creating a Citizen Science co-ordinator post to support CS efforts

- Help recruit new CS and deliver training
- Help co-ordinate activities
- Ensure timely feedback of results to CS / newsletters
- Provide support to take forward citizens ideas and projects
- Involve CS in developing mitigation options

Combine CS with practitioner activities & academic research

Sediment source apportionment and suspended sediment analysis

Question	Methodology	Sector
Which activities is the sediment coming from? What are the relative proportions of different sources?	Sediment source apportionment	Consultant / University
How much NPK is associated with the sediment?	Sediment source apportionment	Consultant / University
Where does sediment enter the channel (potential)?	SCIMAP	University / Conservation group
Where does sediment enter the channel (observations)?	MudSpotter trial	Citizen Science / Conservation group
How much suspended sediment is moving through the river?	Philips samplers	Research
Does the sediment cloak the river gravels? At what times of year?	MorPh	Citizen Science / Conservation group
Is the fine sediment a threat to invertebrates?	SmartRivers	Citizen Science / Conservation group

Citizen Science activities

Please do get in touch

Would you like to help assess the current state of the River Chess, and learn more about the river? Do you have pressing questions about the health of the River Chess that you would like to see answered?

We are hoping to carry out the following investigations in the river over the next year and would welcome your help to answer the following questions…

- How much fine sediment is entering the River Chess, where does it enter and how does it move through the river?
- What are the critical pressures on the living organisms in the river, and how do these pressures change during and after the Smarter Water Catchments programme?
- How diverse is the habitat in the channel and on the banks and how does it change in response to restoration efforts?
- How does the water quality of the River Chess respond to rainfall in the lower reaches of the river around Rickmansworth?

Please contact chessCS@chilternsaonb.org to express your interest in any of our volunteering activities.

Thank you

Working in partnership

Thames Water
The River Chess Association
Chilterns Chalk Streams Project
CHILTERNS CONSERVATION BOARD
Chiltern Society
We care for the Chilterns
Buckinghamshire Council
Environment Agency
Affinity Water
Herts & Middlesex Wildlife Trust
Queen Mary University of London

Urban Runoff

Key Tasks

- Assess information on Sources of pollution and Pathways of Urban Runoff into the Chess (mainly Desktop)
- Develop an Action Plan, Identify Further Investigations, Data Gaps
- Follow a Holistic and Collaborative Approach

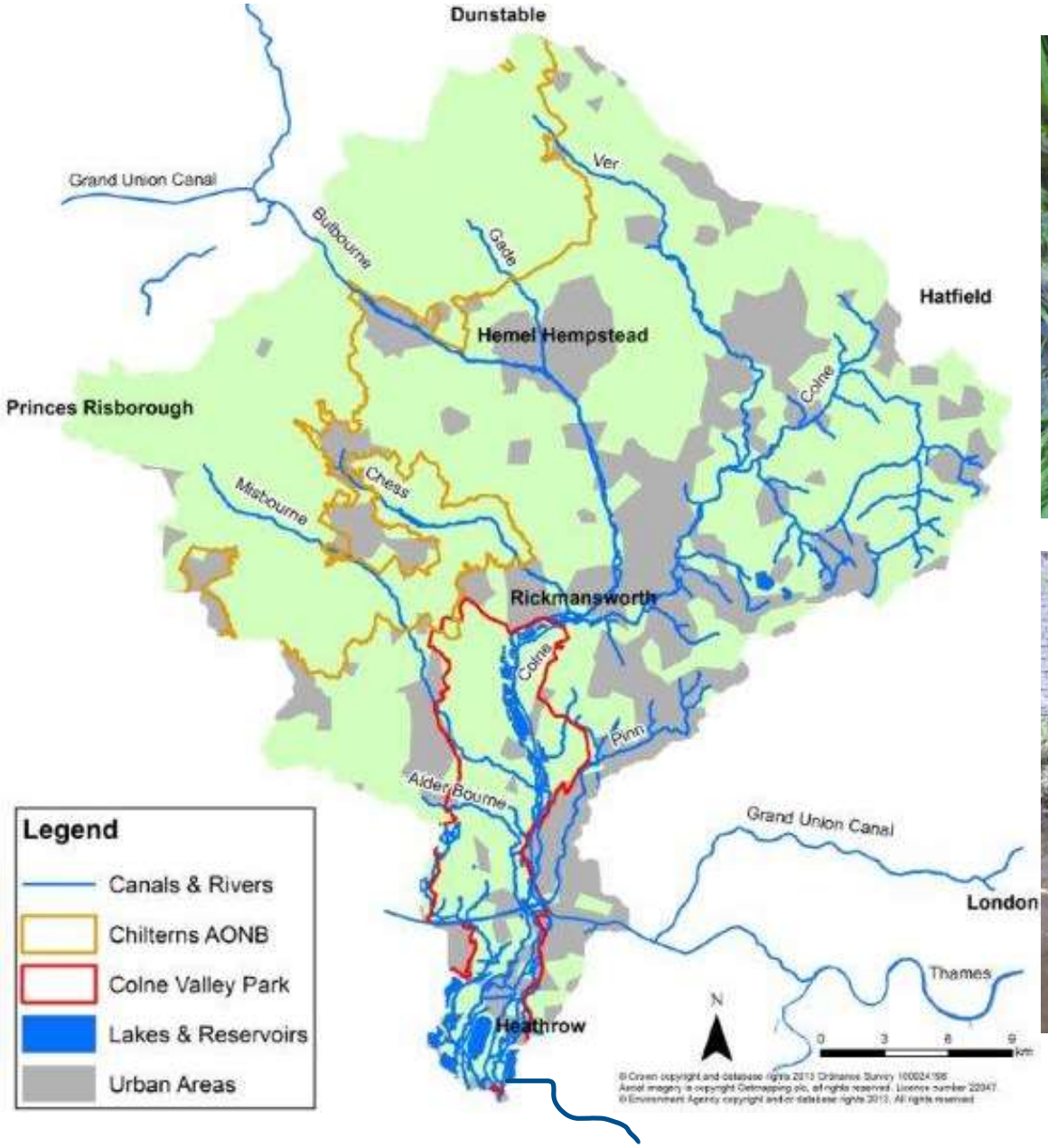
Catchment in crisis: The Pressures of Development

The Colne Valley Regional Park – development pressures and responses

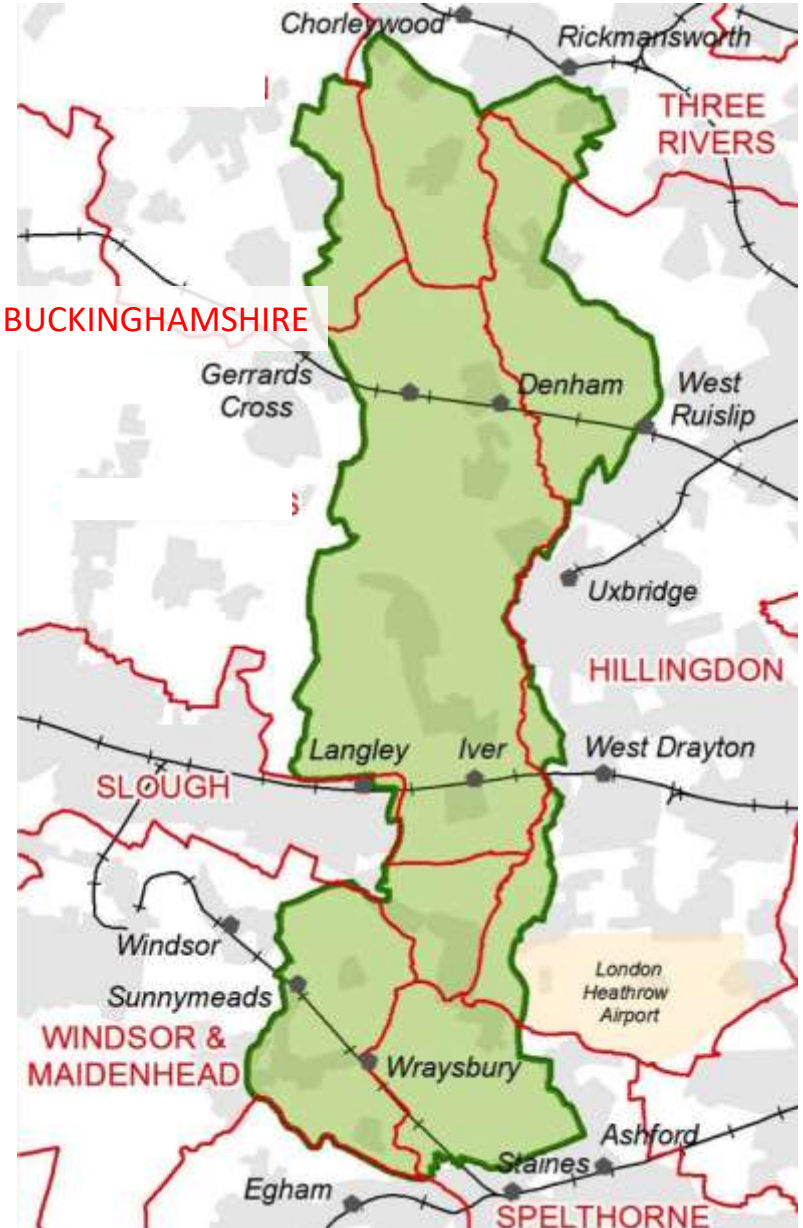
Stewart Pomeroy

Colne Valley Park Managing Agent

The State of our rivers. Water quality & Water quantity.



Colne Valley Regional Park



43 square miles

>3M people within 10 miles

70 lakes + 200km rivers/canals

100's of green spaces, 5 country parks, 20 Nature Reserves, 13 SSSI's

270km of public rights of way

CVRP - key to fulfilling the positive aspects of Green Belt policy

Key to physical and mental health, biodiversity & farming

Most pressured part of the (inner) Green Belt

Contractors at work at Hithermoor Weir

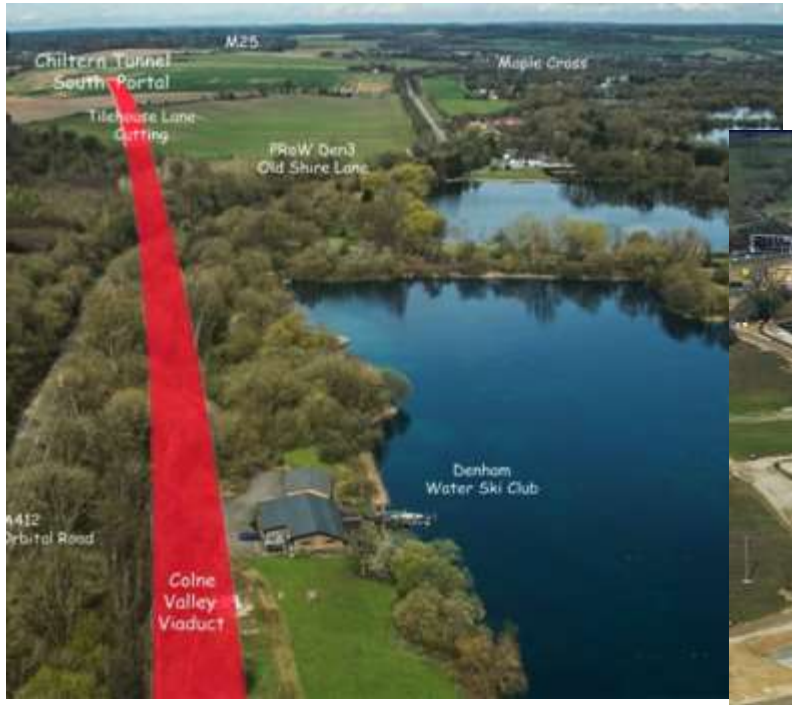
£10 of projects for every £1 invested by local authorities and corporate supporters.

Applying national policy - observations

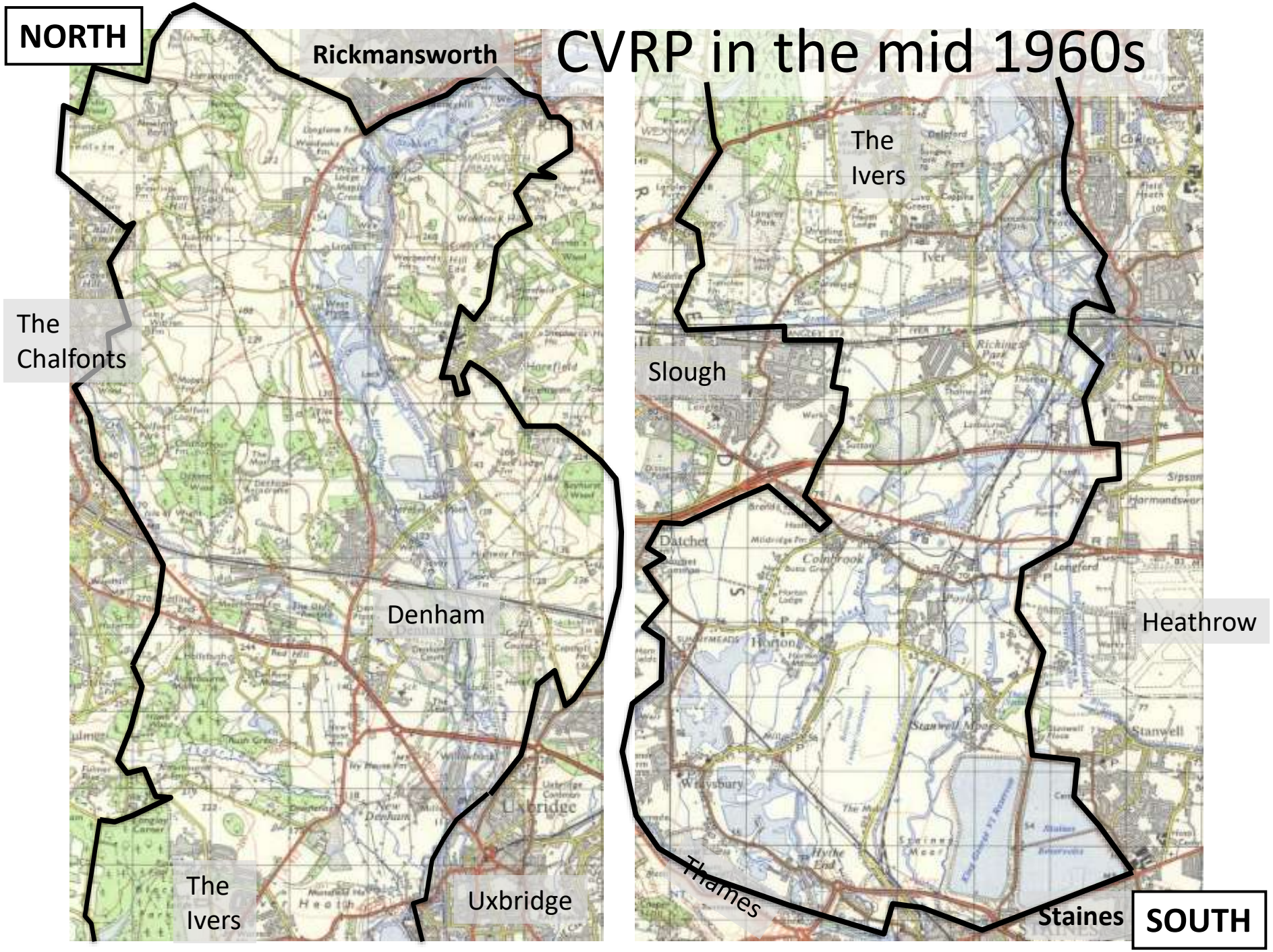
- Too much just a green wash on the map … but ...

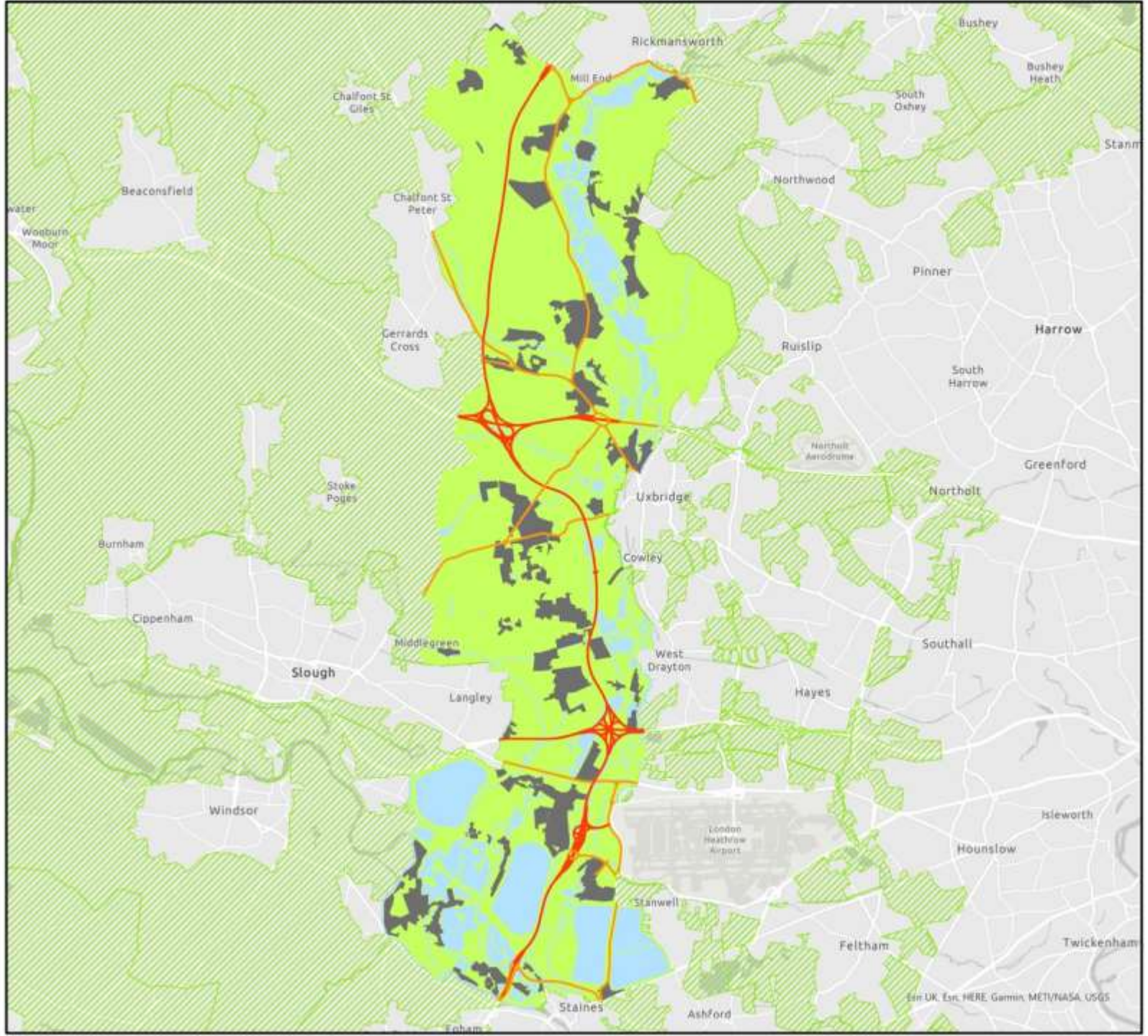
> "145. Once Green Belts have been defined, local planning authorities should plan positively to **enhance their beneficial use**, such as looking for opportunities to **provide access**; to provide opportunities for outdoor **sport and recreation**; to **retain and enhance landscapes, visual amenity and biodiversity**; or to **improve damaged and derelict land**."

- Very special (Plg applications) or exceptional (Plans) circumstances - essentially about meeting the need for development
- Housing Formula fails to take proper account of Green Belt
- NPPF Para 142 (compensatory improvements) - but only to plans?
- Strategic view needed and strategy for improvement


M25
Chiltern Tunnel
South Portal
Maple Cross
Tilehouse Lane
Cutting
PRoW Den3
Old Shire Lane
Denham
Water Ski Club
A412
Orbital Road
Colne
Valley
Viaduct

CVRP in the mid 1960s

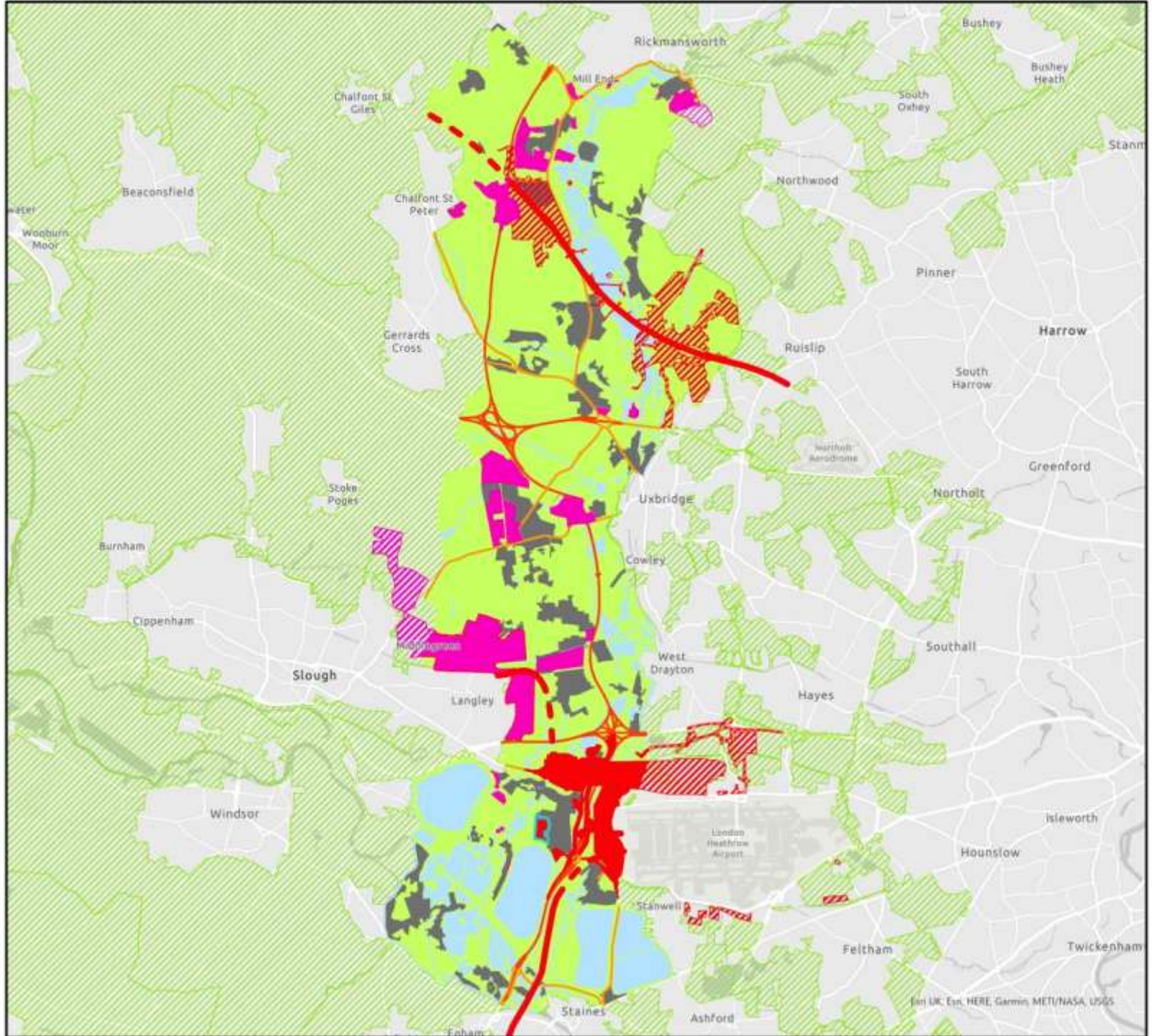




Colne Valley Regional Park (2018)

GROUNDWORK
CHANGING PLACES
CHANGING LIVES

0 1.25 2.5 5
Kilometers



Colne Valley Regional Park (The Future?)

Showing approved schemes (current Pinewood Studios expansion & HS2 works) and if planned proposals (from Local Authorities and others) are followed through

GROUNDWORK
CHANGING PLACES
CHANGING LIVES

0 1.25 2.5 5
Kilometers

Is this where the CVRP and Green Belt should go?

Is it what the government wants and intended?

Time to take stock around the future of the CVRP and Green Belt.

2019 G.I. Strategy

COLNE & CRANE VALLEYS
GREEN INFRASTRUCTURE STRATEGY
SEPTEMBER 2019
EXECUTIVE SUMMARY

HERITAGE FUND

Colne Valley Regional Park

Crane Valley Partnership

ARUP

Landscape Institute Awards 2019 — FINALIST — Landscape Planning and Assessment Award

https://www.youtube.com/watch?v=-TF0eKDh9vc

Strategic Planning

Honesty

NPPF changed so all major applications are seen as strategic

Housing targets/ infrastructure **projects** that **take account of GB** and why it has been designated

Vision for what the (inner) Green Belt is about – a multi-functional natural resource

A **regime** to enable CVRP to get on with its job - with **resources** - well placed to protect and improve

Thank You

www.colnevalleypark.org.uk

Follow on facebook & twitter.

Join the Friends of the Colne Valley Park.

QUESTIONS

Catchment Hosting & Getting Ready for Smarter Water Catchment

Stewart Pomeroy

The CaBA chalk stream restoration strategy, Chalk Streams First and the Colne's chalk streams

October 2021, after 12 months' work, we published the CaBA chalk stream restoration strategy

Who was involved?

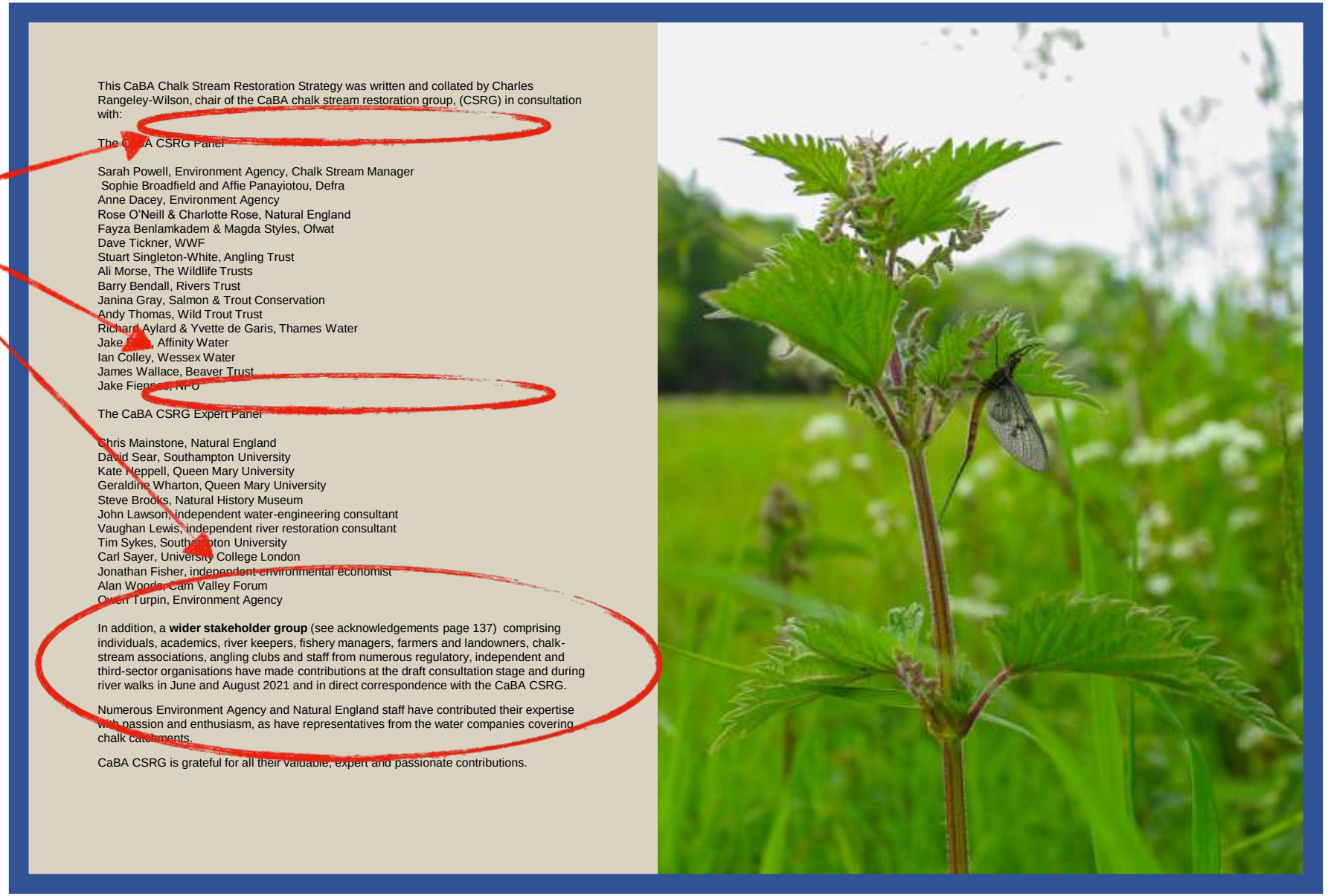
- CaBA CSRG main panel
- CaBA CSRG expert panel
- CaBA CSRG stakeholders (open to all)

Consultation during 2021

- numerous meetings of all panels
- thousands of emails and phone calls
- formal consultation
- stakeholder river walks

Creating a consensus strategy with 30+ recommendations.

Launched in October 2021.
Fully timetabled implementation plan scheduled for October 2022.



This CaBA Chalk Stream Restoration Strategy was written and collated by Charles Rangeley-Wilson, chair of the CaBA chalk stream restoration group, (CSRG) in consultation with:

The CaBA CSRG Panel

Sarah Powell, Environment Agency, Chalk Stream Manager
Sophie Broadfield and Affie Panayiotou, Defra
Anne Dacey, Environment Agency
Rose O'Neill & Charlotte Rose, Natural England
Fayza Benlamkadem & Magda Styles, Ofwat
Dave Tickner, WWF
Stuart Singleton-White, Angling Trust
Ali Morse, The Wildlife Trusts
Barry Bendall, Rivers Trust
Janina Gray, Salmon & Trout Conservation
Andy Thomas, Wild Trout Trust
Richard Aylard & Yvette de Garis, Thames Water
Jake [illegible], Affinity Water
Ian Colley, Wessex Water
James Wallace, Beaver Trust
Jake Fiennes, NFU

The CaBA CSRG Expert Panel

Chris Mainstone, Natural England
David Sear, Southampton University
Kate Heppell, Queen Mary University
Geraldine Wharton, Queen Mary University
Steve Brooks, Natural History Museum
John Lawson, independent water-engineering consultant
Vaughan Lewis, independent river restoration consultant
Tim Sykes, Southampton University
Carl Sayer, University College London
Jonathan Fisher, independent environmental economist
Alan Woods, Cam Valley Forum
Owen Turpin, Environment Agency

In addition, a **wider stakeholder group** (see acknowledgements page 137) comprising individuals, academics, river keepers, fishery managers, farmers and landowners, chalk-stream associations, angling clubs and staff from numerous regulatory, independent and third-sector organisations have made contributions at the draft consultation stage and during river walks in June and August 2021 and in direct correspondence with the CaBA CSRG.

Numerous Environment Agency and Natural England staff have contributed their expertise with passion and enthusiasm, as have representatives from the water companies covering chalk catchments.

CaBA CSRG is grateful for all their valuable, expert and passionate contributions.

Why do chalk streams need this strategy?

Because they are:

• Globally unique

• Ecologically rich: the most biodiverse of all English rivers.

But also ...

• under intense pressure: they flow through the most urbanised, industrialised and farmed parts of the UK.

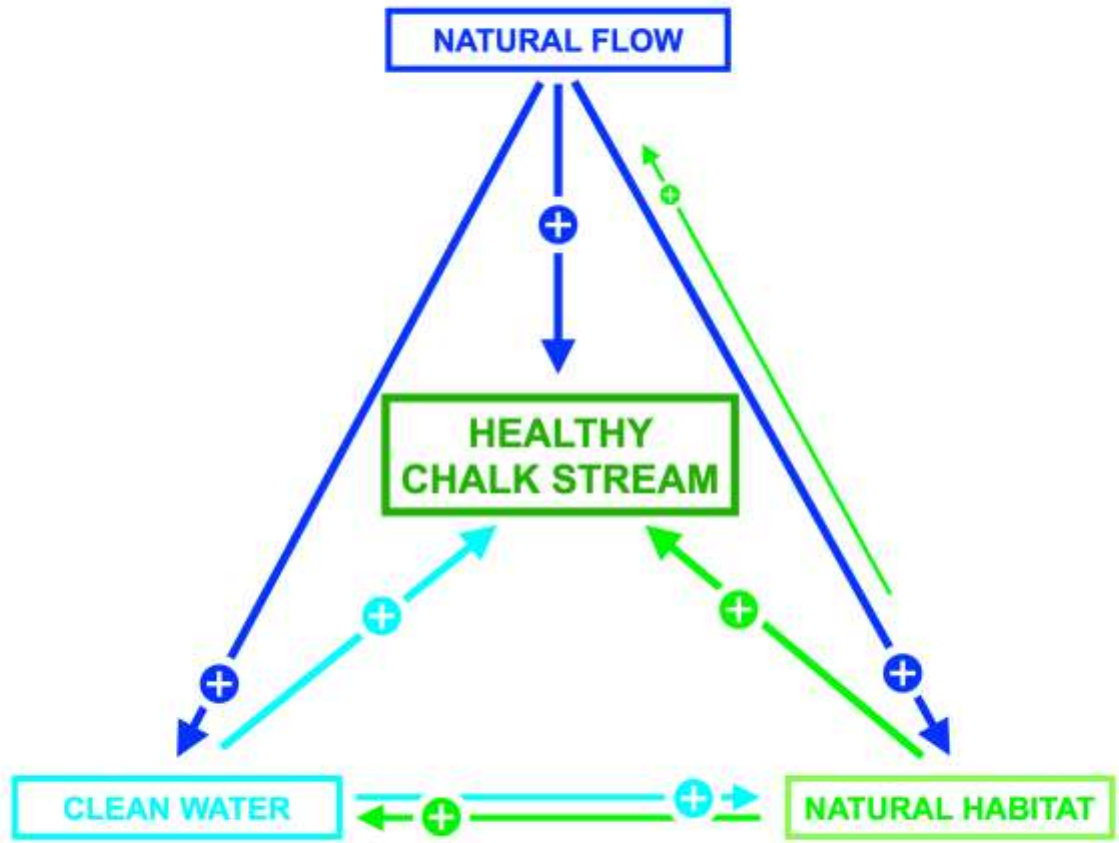
How the strategy is structured:

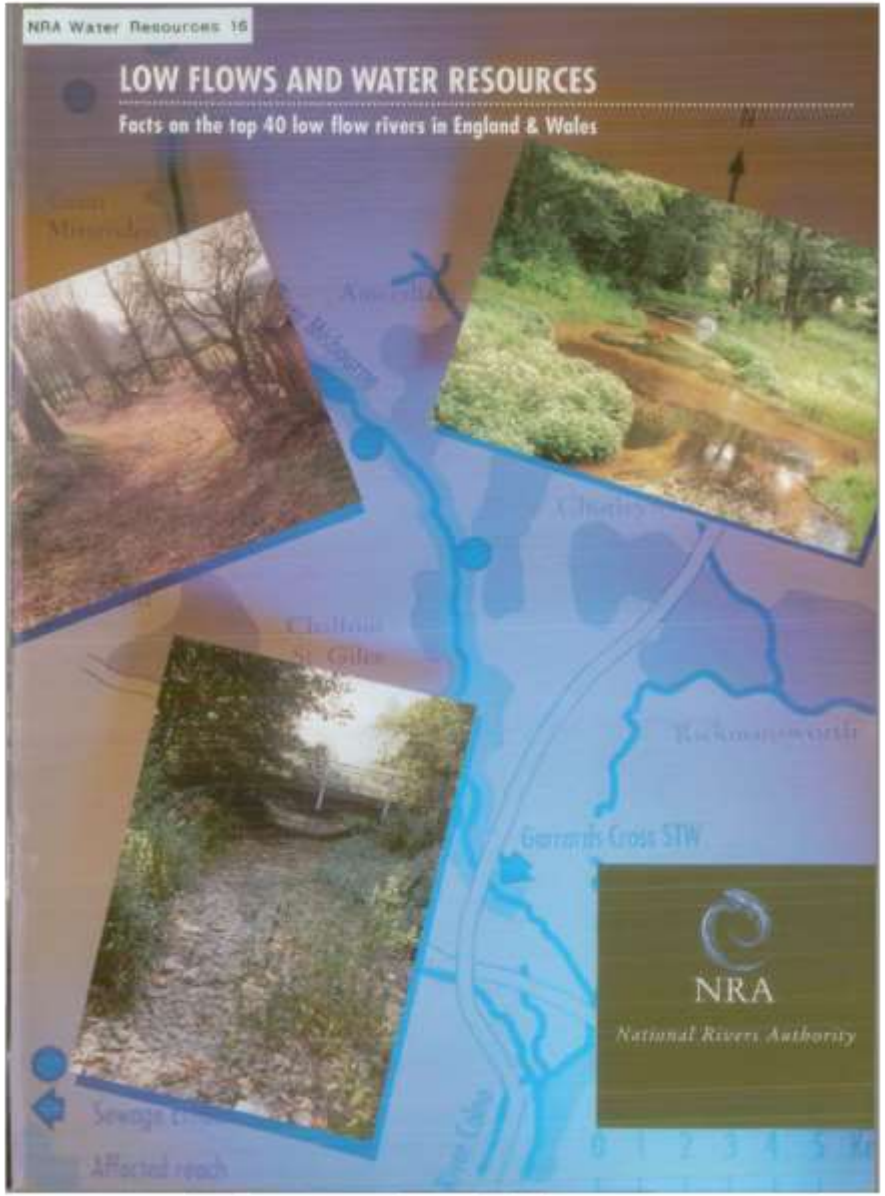
It is based around the three components of ecological health:

water quantity
water quality
physical habitat.

Improvements in one greatly magnify improvements in the other two.

The best restoration strategies address all three components.





Water Quantity - groundwater abstraction in chalk streams

Groundwater abstraction ballooned in the post-war years peaking in the mid-1980s when in some catchments over half of the water available to the river – and in dry years, all of it – was abstracted.

The scale of the impact was made all the more vivid by a drought in the late 1980s early 1990s

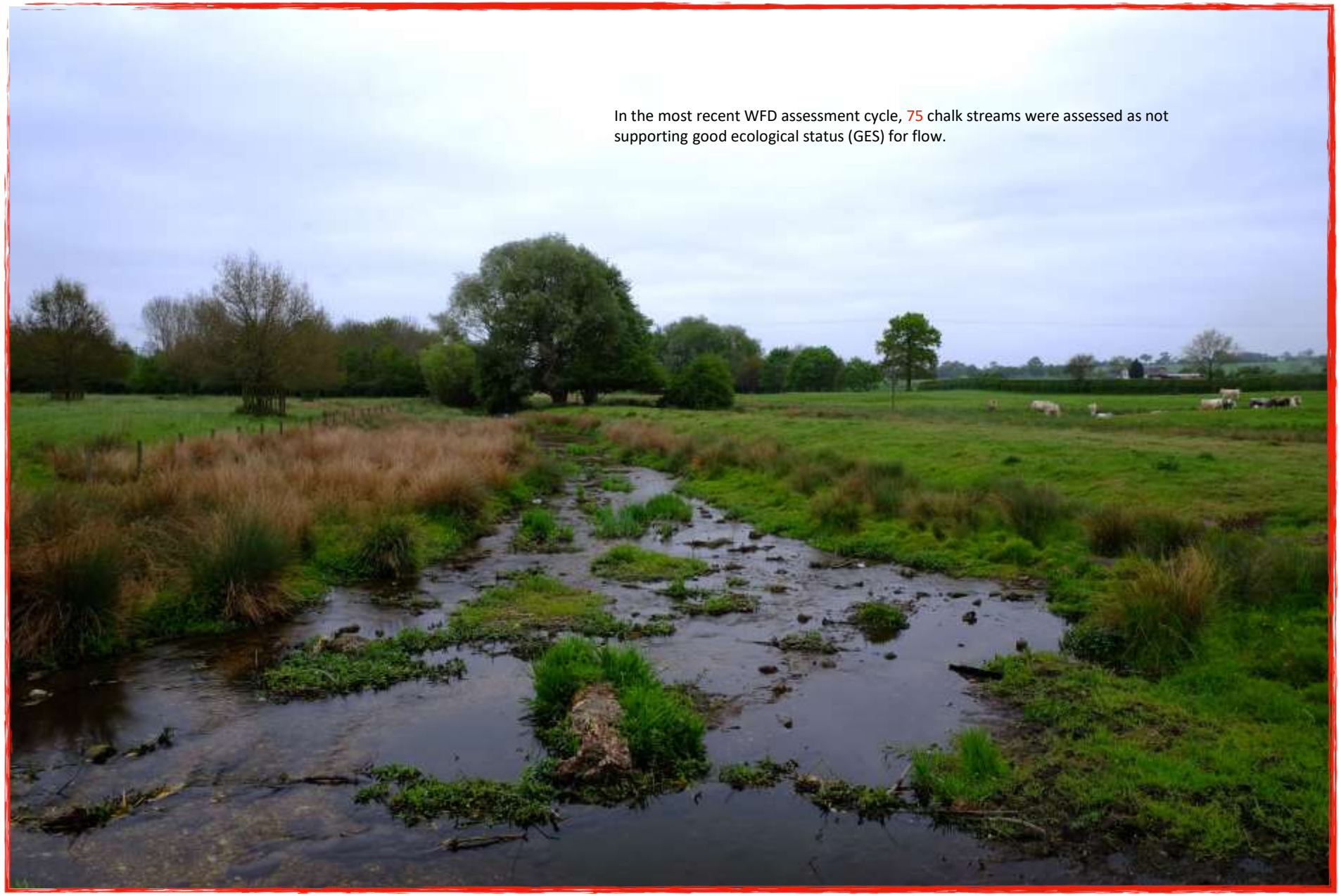
The River Darent 2005

The River Ver 2017

The River Misbourne 2005

Of the 15 chalk streams identified by the NRA in 1991 as suffering from acute low flows, only 5 pass Water Framework Directive targets for flows in 2021, some 30 years later!

The River Wey (Dorset)
The River Piddle
The River Allen
The Wallop Brook
The Bourne Rivulet
The River Meon
The River Wey (Surrey)
The River Pang
The Letcombe Brook
The River Ver
The River Misbourne
The River Darent
The Little Stour
The River Hiz
The Hoffer Brook


In the most recent WFD assessment cycle, 75 chalk streams were assessed as not supporting good ecological status (GES) for flow.

The chronic and unnaturally low flows caused by excessive groundwater abstraction adversely impact the ecology of a chalk stream by:

- reducing velocity of the current
- reducing water depth and the spatial volume of in-channel habitat
- increasing the residence time of water in the river channel
- increasing the temperature of water in the channel
- increasing the concentration of pollutants
- reducing oxygen levels
- increasing sediment deposition
- reducing or interrupting the connectivity between the river and its marginal, riparian habitats and floodplain
- disrupting the passage of migratory fish

These pressures interact and have a spiralling, cumulative impact.

For example, reduced water velocity will limit the growth of the rheophilic (current-loving) plants like ranunculus and increase the deposition of sediment in the channel.

The sediment in turn also limits the growth of ranunculus.

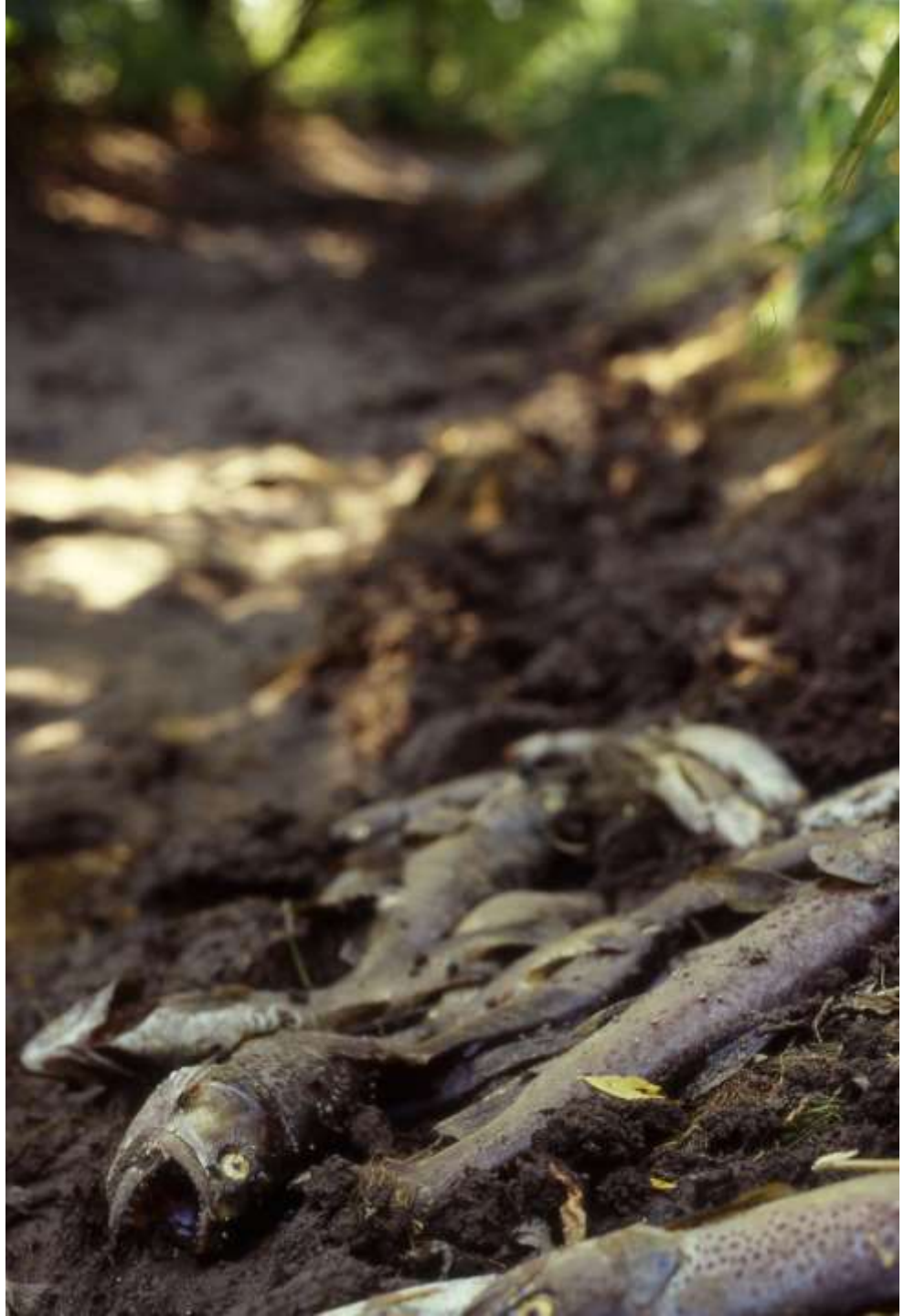
The lack of ranunculus reduces the inter-crown scour that flushes sediment.

Depleted summer flow velocities are reduced yet further because the channel is effectively bigger relative to the volume of water – because of the lack of ranunculus.

The reduced flow and the lack of ranunculus drive up water temperature, decrease oxygen levels, limit habitat for fish and insects.

And so on. The chalk stream becomes locked in a vicious circle of decline and the negative impact of every other stress exerted on the system is magnified.

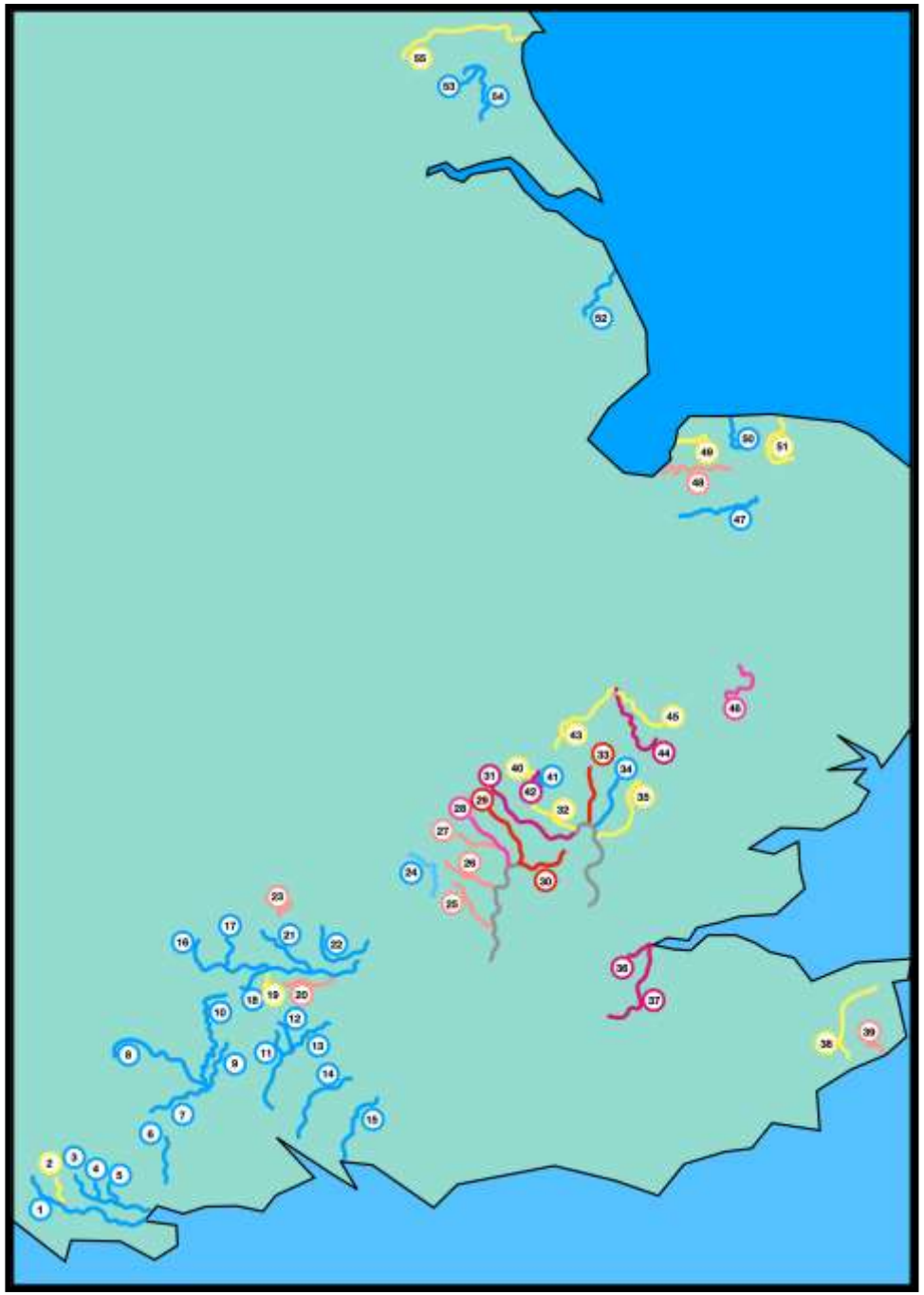
"Over abstraction of chalk streams is a very bad thing"

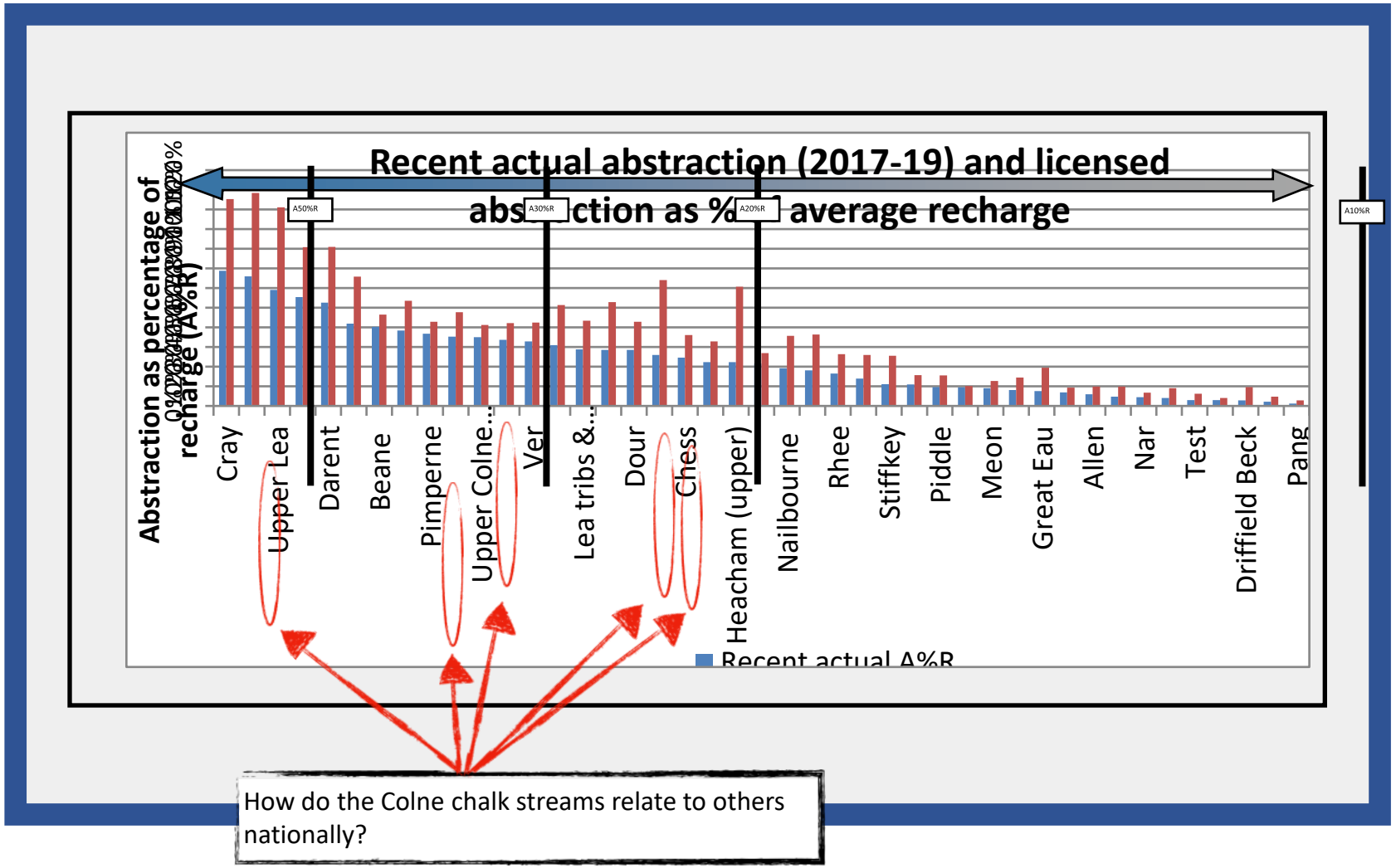


Our CaBA abstraction as a % of recharge survey shows the scale of groundwater abstraction pressure across the country.

Ranging from almost zero on the River Ebble to over 60% on rivers like the Cray, Darent, and Upper Lea.

No	Name	A%R	Deficit to A10%R
1	Frome	2.1%	0
2	Cerne	15.7%	2.8 Ml/d
3	Piddle	9.5%	0
4	Devil's Brook	8.5%	0
5	Bere	4.5%	0
6	Allen	5.8%	0
7	Ebble	0.1%	0
8	Wylye	5.8%	0
9	Bourne (Wilts)	5.4%	0
10	Avon upper	6.3%	0
11	Anton	6.8%	0
12	Bourne (Hants)	0.7%	0
13	Upper Test	2.5%	0
14	Itchen	6.9%	0
15	Meon	6%	0
16	Kennet	8.1%	0
17	Og	1.7%	0
18	Dun	2.1%	0
19	Shalbourne	11.7%	0.2 Ml/d
20	Enbourne	23.3%	11 Ml/d
21	Lambourn	3.8%	0
22	Pang	1.1%	0
23	Letcombe Brook	28.5%	2.7 Ml/d
24	Wye	9%	0
25	Misbourne	22.3%	9.6 Ml/d
26	Chess	24.6%	9.8 Ml/d
27	Bulbourne	28.2%	6.3 Ml/d
28	Gade (excl Bulbourne)	48.4%	9.7 Ml/d
29	Ver	32.8%	19.5 Ml/d
30	Colne upper	35%	29.6 Ml/d
31	Lea upper	59%	40.2 Ml/d
32	Mimram	13.9%	2.9 Ml/d
33	Rib & Quin	33.6%	16.1 Ml/d
34	Ash	3.1%	0
35	Stort	18.5%	11.5 Ml/d
36	Cray	68.7%	45.6 Ml/d
37	Darent	52.5%	64.2 Ml/d
38	Nailbourne	19.2%	7 Ml/d
39	Dour	28.5%	13 M/d
40	Oughton	18.4%	0.4 Ml/d
41	Purwell	4.1%	0
42	Hiz upper	58%	4.1 Ml/d
43	Rhee	16.4%	7.4 Ml/d
44	Cam upper	52%	12.3 Mld
45	Granta	19%	3.9 Ml/d
46	Lark upper	43.9%	8 Ml/d
47	Nar upper	4.5%	0
48	Babingley	21.9%	8.9 Ml/d
49	Heacham	15.9%	2.1 Ml/d
50	Burn	4.1%	0
51	Stiffkey	11%	1.1 Ml/d
52	Great Eau	7.5%	0
53	Driffield Beck	2.8%	0
54	Driffield Trout Stream	3.7%	0
55	Gypsey Race	10.9%	1.6 Ml/d




Recent actual abstraction (2017-19) and licensed abstraction as % of average recharge
Abstraction as percentage of recharge (A%R)
A50%R
A30%R
A20%R
A10%R
Cray
Upper Lea
Darent
Beane
Pimperne
Upper Colne...
Ver
Lea tribs &...
Dour
Chess
Heacham (upper)
Nailbourne
Rhee
Stiffkey
Piddle
Meon
Great Eau
Allen
Nar
Test
Driffield Beck
Pang
Recent actual A%R
How do the Colne chalk streams relate to others nationally?

The CaBA group has agreed on a definition of and target for sustainable abstraction in chalk streams: one where the flows are reduced by no more than 10% at the stressed time of year Q95.

There are various ways to assess abstraction impact on flow but a very simple one is the % of aquifer recharge that is taken by groundwater abstraction: A%R.

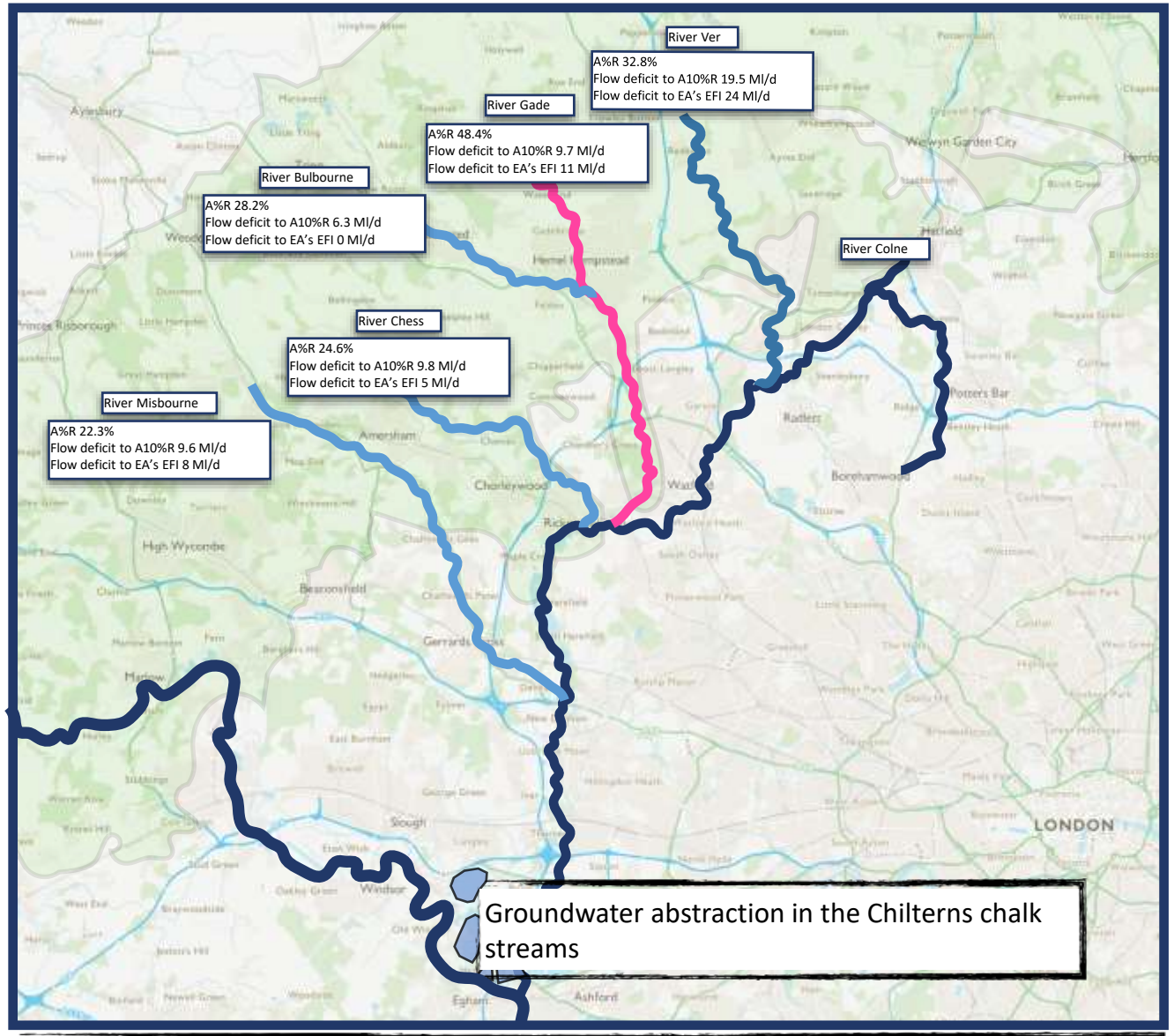
Modelling* indicates that A%R should be no more than 10% if flows are to be reduced by no more than 10%, especially in the ecologically delicate chalk-streams, tributaries.

The Colne chalk streams range from A22%R to A48%R.

The total deficits to achieving A10%R in the Colne chalk stream tributaries are:

Misbourne 10Ml/d
Chess 10 Ml/d
Bulbourne 6Ml/d
Gade 10 Ml/d
Ver 20 Mld

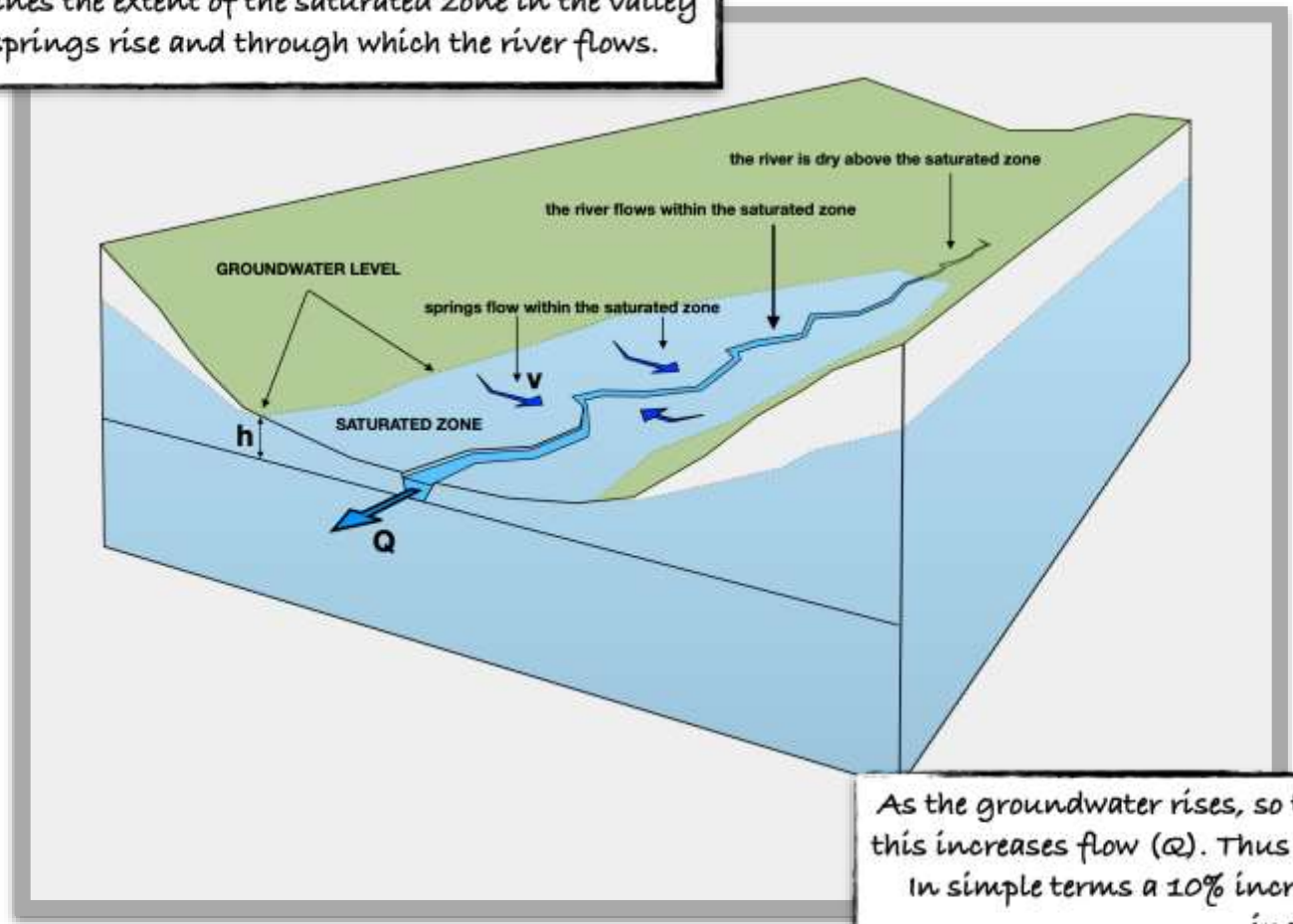
That's a total deficit of 56 Ml/d to restore all the Colne chalk streams to sustainable flows which would support good ecological health (assuming they aren't polluted, of course!).



* figures from independent modelling based on River Ver 'Friar's Wash' sustainability reduction

How a chalk stream works

A simplified diagram of a chalk-stream valley showing how the groundwater level - which generally rises in winter and falls through the summer - determines the extent of the saturated zone in the valley floor, from which springs rise and through which the river flows.



As the groundwater rises, so the hydrostatic head (pressure) rises and this increases flow (Q). Thus flow is proportional to groundwater level. In simple terms a 10% increase in groundwater level yields a 25% increase in flows.

Hydrostatic pressure drives the water out of the "river" holes in the side of the bucket.

Flow in = flow out. The bucket aquifer is in equilibrium.

Add another from of discharge (by taking the cork out of the other hole) and if the recharge remains the same the water level in the bucket MUST go down and the flow through the 'river' holes MUST diminish.

Theis described this in 1940: the ONLY way an extra form of discharge can reduce the former discharge is by "reducing the thickness of the aquifer".

Flow Recovery is the same process in reverse: end the additional form of discharge (abstraction) and if the recharge remains the same the level in the bucket MUST go up and the flow through the river holes will inevitably return to its former rate (all other things being equal).

RIVER VER - FLOW RECOVERY

River flow in the River Ver at Hansteads relative to the Friar's Wash groundwater abstraction

	1957-1969 preceding FW abstrcation	1970-1992 during FW abstraction	1993-2017 following FW reduction	1982-1992 with abstraction	2007-2017 post abstraction	Difference
Ave. effective rain mm/year	273	278	277	262	262	0
Ave. abstraction Ml/d	29.6	40.0	30.5	43.5	29.1	-14.4
Ave. flow Ml/d	42.3	30.8	42.5	26.4	38.5	12.1

Comparing ten-year periods with identical average effective rainfall of 262 mm / year from pre- and post-abstraction reduction: - a 14.4 Ml/d abstraction reduction saw a 12.1 Ml/d – 84% – increase in average flows

Chalk Streams First

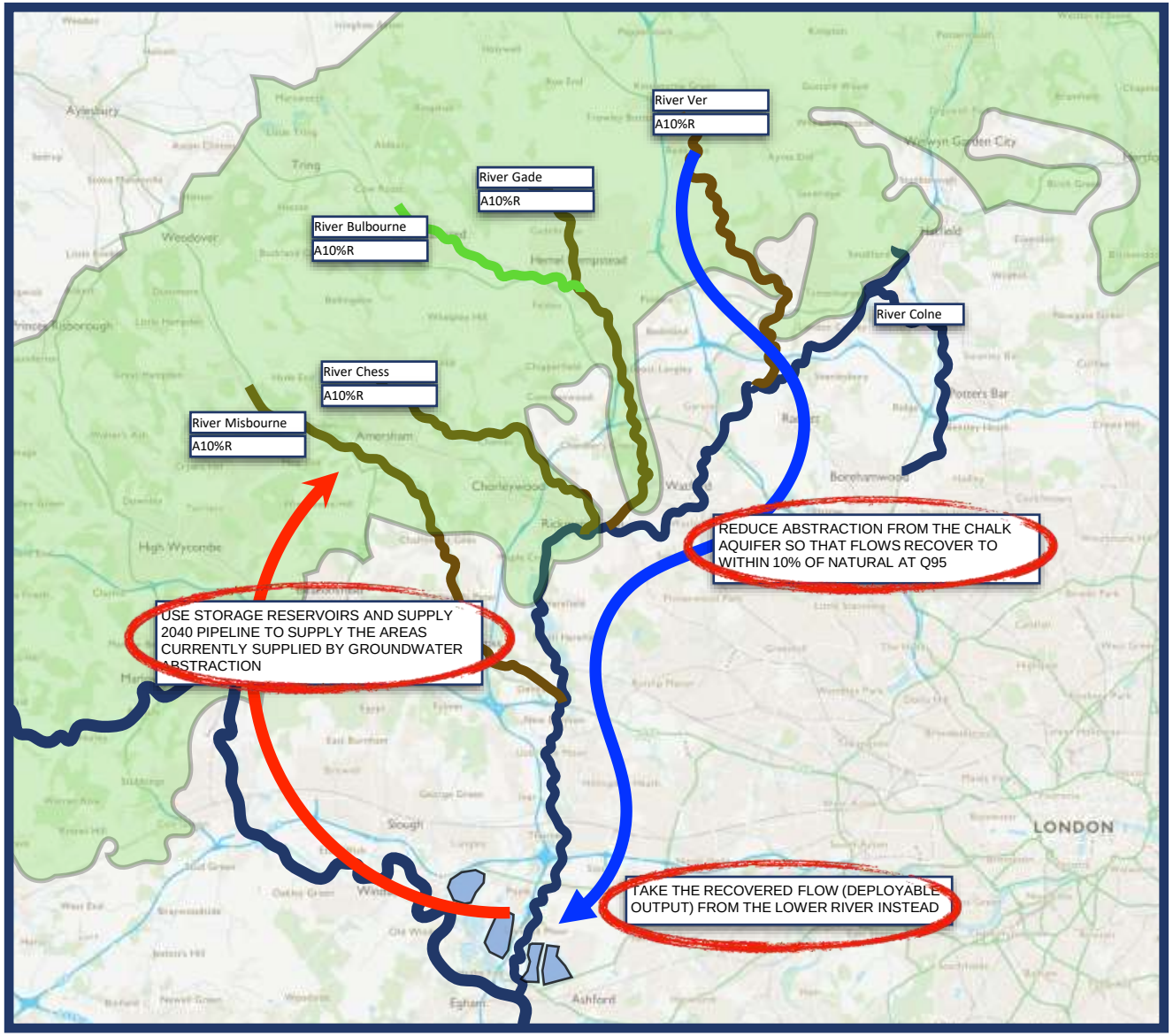
Using flow recovery to square the economic circle

Reduce abstraction in the chalk valleys to below A10%R. This "sustainable abstraction" in the chalk streams still yields 29 Ml/d.

Of the 56 Ml/d not abstracted 80% becomes available as surface flow lower down the catchment.

This water can be taken into storage in the London reservoirs, and the pipeline "Supply 2040" – already in Affinity Water's business plan – can be used to pipe the water to the places formerly supplied by groundwater abstraction.

There would be a loss to overall supply and we need to find that water from elsewhere. And there would be treatment costs. But this is exactly how we would design this use of our precious water if we were starting again from scratch.



The proposal was launched in May 2020 by a coalition of The Rivers Trust, The Angling Trust, WWF, The Wild Trout Trust and Salmon & Trout Conservation

Our request was that the idea should receive independent assessment

as a stand-alone strategic resource option

and as part of other Thames to Affinity Transfer options which include, for example, Abingdon reservoir, Severn to Thames and Grand Union Canal transfers.

Thus far Chalk Streams First has been:

recognised and conditionally supported by regulators

made a key recommendation as a flagship flow-recovery project in the CaBA strategy

included in Ofwat's strategic resource investigations

and is being considered in Thames Water and Affinity investigations of the ‘Thames to Affinity Transfer (T2AT)

However, there was no mention of the scheme in the WRSE draft regional plan.

And there was a disclaimer:

"... it is likely that the plan will enable tangible progress to be made with respect to recovering chalk streams – depending on the environmental ambition that is selected in company WRMPs. Despite this, we recognise that the progress may not meet the expectations of all stakeholders ..."

The environmental ambition is key: but in the draft plans although vast flow deficits have been identified – greatly exceeding anything needed to restore chalk streams – there is little detail on these at a river by river level.

Without detail and prioritisation, there is a danger that environmental ambition will be reined in by financial expedience right across the map and we will have lost the best chance we've ever had to restore flows to our iconic chalk streams.

There may be uncertainty as to EXACTLY how much flow will return, but ...

we only need 56 Ml/d to re-naturalise flow in the Colne's five iconic chalk tributaries

and some of that WILL be made available by flow recovery as deployable output

Grand Union Canal transfer could offset all the uncertainty, anyway.


Chalk Streams First is the best chance we've had to undo the damage caused to our precious chalk streams by decades of over abstraction
Future generations will judge us harshly if we don't take it.