

Water Resources East

Safeguarding a sustainable supply of water for Eastern England

River Lark Catchment Partnership – 25th November 2021

Dr Robin Price

Managing Director

WRE VISION

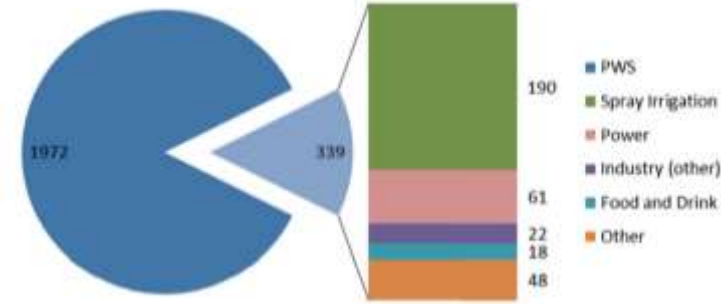
WRE's vision is for Eastern England to have sufficient water resources to support a flourishing economy, a thriving environment and the needs of its population, and for the region to be seen as an international exemplar for collaborative integrated water resource management.

WRE'S OVERARCHING REGIONAL STRATEGY FOR EASTERN ENGLAND

- 1 Work with all water users in Eastern England to identify ways in which they can become as water efficient as they can be.
- 2 Promote the need for additional storage of water within the landscape, increasing resilience for all water users and seeking to identify multi-sector opportunities to link water scarcity with flood risk management solutions.
- 3 Transfer water from areas of surplus to areas of deficit, increasing connectivity using both open water channels as well as pipelines.
- 4 Link land and water management more effectively, increasing resilience and restoring and enhancing the natural systems and resources on which all abstractors depend.
- 5 Understand where abstraction is having a detrimental impact on the environment, and develop options which restore and enhance it whilst ensuring sustainable economic development, for example around agriculture and food production.
- 6 Actively explore other potential sources of water for our region, for example desalination and water re-use.
- 7 Contribute to low carbon strategies and plans, helping the region to meet a net zero ambition.

The challenge is increasing.....

Sector	Pressure	Dry Year Annual Average Estimated Impact (MI/d)		Comment
		Lower	Upper	
Public Water Supply	Climate Change	54	180	Includes range of possible high/low climate change impacts - mostly on reservoir yields
	Sustainability Reductions	139	500	Upper limit accounts for indicative levels of enhanced environmental ambition
	Growth (population)	159	408	Upper limit accounts for maximum possible build-out rates in OxCam Arc and failure to make significant progress with planned demand management measures
	Drought resilience	88	88	Note: methodology uncertainties which are subject to work in progress
	Regional exports	(-)	(-)	Unknown at this stage, although 100 MI/d export is currently assumed for work on the South Lincolnshire Reservoir scheme
Power	Decarbonisation	17	192	Assumes rapid transition to Hydrogen economy with 20% of the national production in WRE region
Agriculture	Growth (irrigation)	74	288	Based on range of plausible growth factors for spray irrigation in the WRE region
Total		531	1,656	



2,311 MLD today.....

Potentially a further 2,481 MLD by 2050?

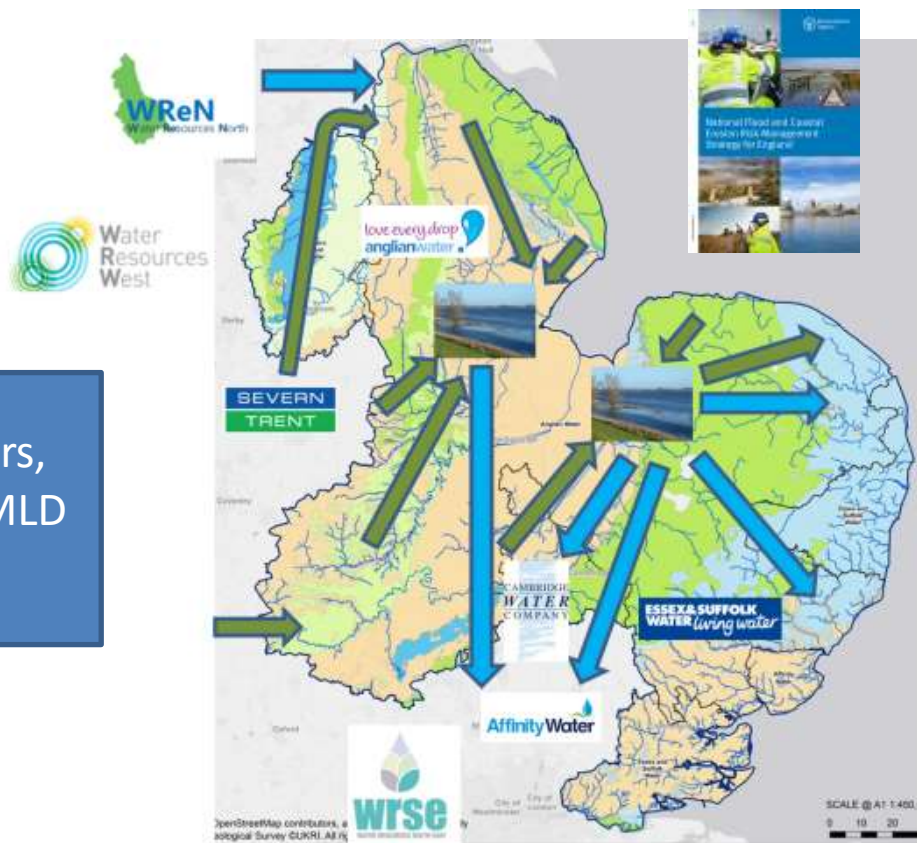
Sector	BAU	ADAPT-ASB2	ADAPT-ASB1	ADAPT	BAU+	COMBINE	ENHANCE
Public water supply	-520	-662	-806	-865	-899	-922	-941
Agriculture	-176	-117	-149	-217	-204	-237	-247
Industry	-40	-40	-54	-64	-62	-67	-76
Amenity/environmental	-29	-21	-23	-31	-25	-30	-30
Other	-25	-23	-29	-29	-25	-31	-31
Power generation	0	0	0	0	0	0	0
Total	-790	-862	-1,061	-1,207	-1,216	-1,287	-1,325



Key components of our Regional Plan

1). Demand management – leakage, household use reduction (including smart metering) and multi-sector water efficiency

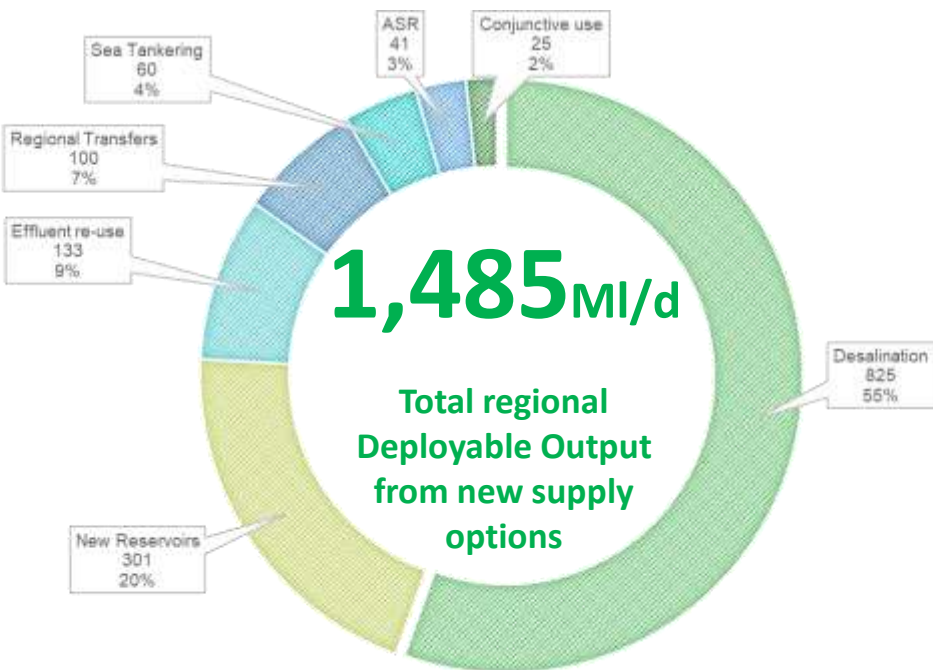
2). Large infrastructure options (eg reservoirs, transfers, desalination, effluent re-use) >10MLD discussed at large Planning Conferences



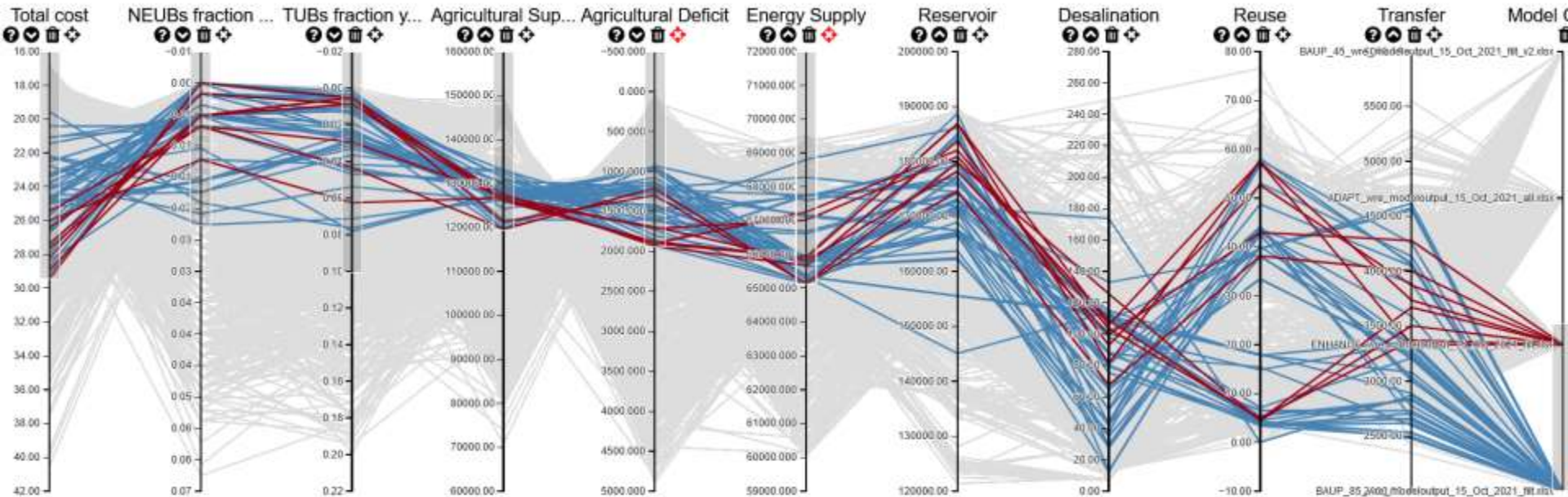
Demand options:

296 ML/D by 2050 (assumes 50% reduction in leakage and a per capita consumption (PCC) of 120 litres per head per day. More multi-sector and non-household work needed!

Supply options:



BAU+ and ENHANCE multi-sector performance w/ aggregate option capacities



Model Outputs

BAU+ 85_wre_modeloutput_1... ENHANCE_wre_modeloutput_15... ADAPT_wre_modeloutput_15... BAU+ 45_wre_modeloutput_1...

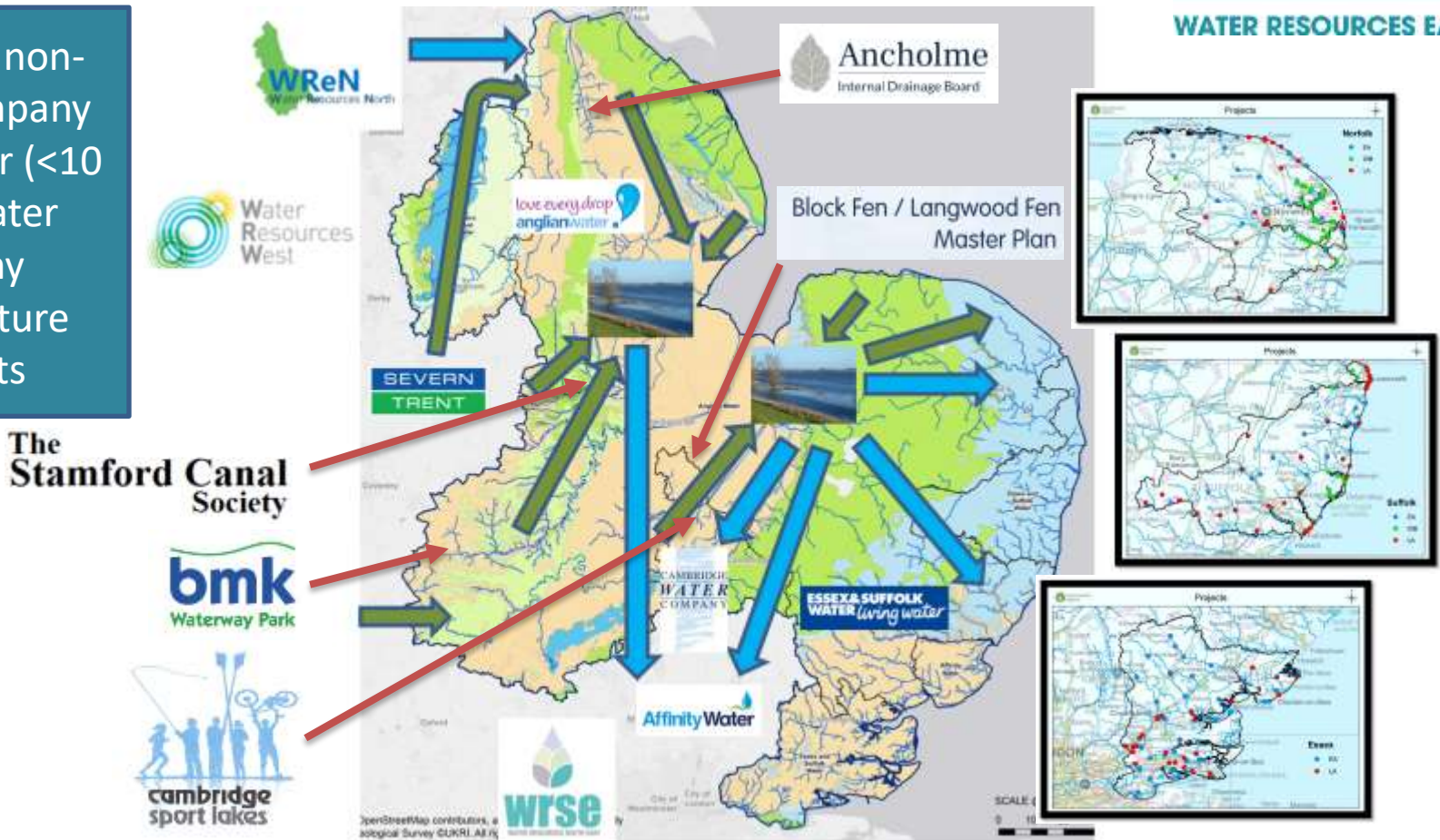
BAU+ builds less desal and transfers than ENHANCE, but similar amounts of reuse

Portfolios of supply-side options

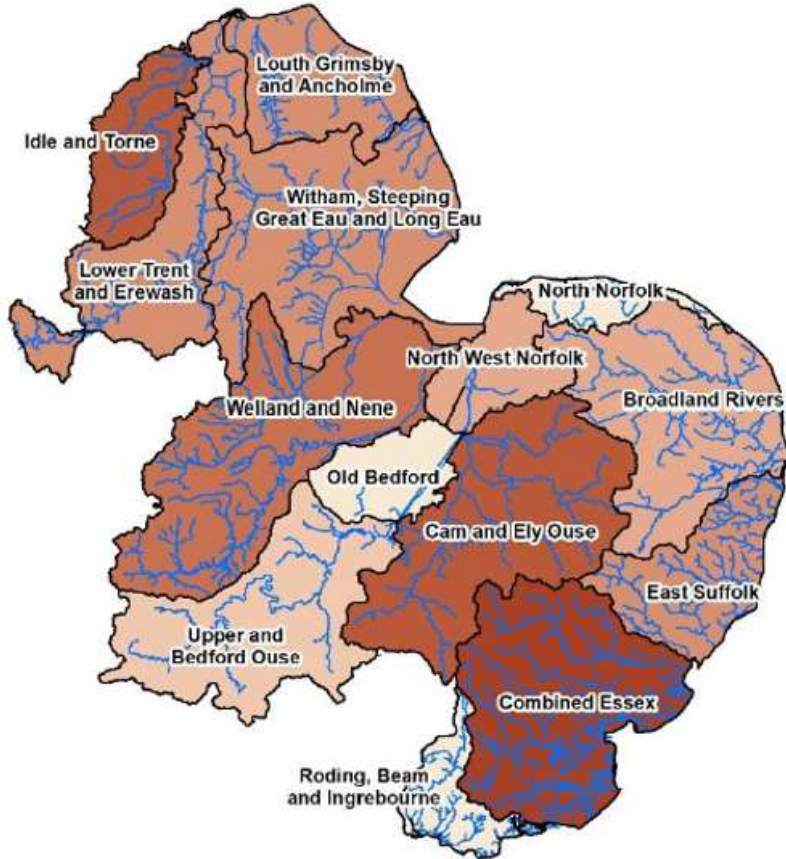
- **Options found in most portfolios include:**
 - **Reservoirs: South Lincolnshire and Fens reservoirs**
 - **Effluent reuse: Colchester**
 - **Desalination: Tilbury, Boston brackish**
 - **Aquifer recharge: Sherwood Sandstone**
- } Low/no regret options?
- **Additional options as the level of environmental ambition and/or the amount of water exported from the region to WRSE increases.....**
 - **Desalination: Large Canvey Island Terrestrial, South Humber Bank Terrestrial, Bacton offshore and a much bigger plant at Tilbury**
 - **Effluent reuse: Southend-on-Sea, Pyewipe (Grimsby)**

Key components of our Regional Plan

3). 'Local' non-water company and smaller (<10 MLD) water company infrastructure projects



Local Focus Workshops



- Position the Environmental Destination and the challenges we collectively face in delivering it, giving stakeholders an opportunity to feedback on scenarios.
- Characterising catchments further to understand wider environmental needs and appropriate investigations/interventions.
- Explore existing (e.g. SCP/existing catchment plans) or new natural capital aspirations and objectives in the catchment and start to align on appetite for short-medium term projects.
- Produce (or feed into) some type of catchment plan in collaboration with key stakeholders using new existing or new multi-sector pathways for delivery and funding.

WRE environmental workstreams

- **Sustainability Reductions needed for Environmental Destination**
 - Evaluation & testing of EA Business As Usual, Enhanced, Combined & Adapt scenarios
- **Environmental Ambition – Sustainable Abstraction**
 - Assessing the ecological benefit of changes to abstraction
- **Environmental Ambition Cost Benefit Analysis to Support Decision-making**
 - Development of a Cost Benefit Analysis (CBA) framework for reductions in abstraction in Public Water Supply systems
 - CBA of other non PWS sectors eg agri-food, energy
- **Integrated Environmental Assessment (IEA)**
 - Strategic Environmental Assessment (SEA), Habitats Regulations Assessment (HRA), Water Framework Directive (WFD) no deterioration, Invasive Non-Native Species (INNS) & biodiversity net gain (BNG) assessments on options (individual & in-combination)
- **Systematic Conservation Planning (SCP)**
 - Targets for management, conservation, restoration & establishment of habitats at parish, catchment and county scale
 - Provides opportunity maps and a decision support tool for prioritisation and delivery of regional natural capital objectives

Terminology.....

Environmental
Destination

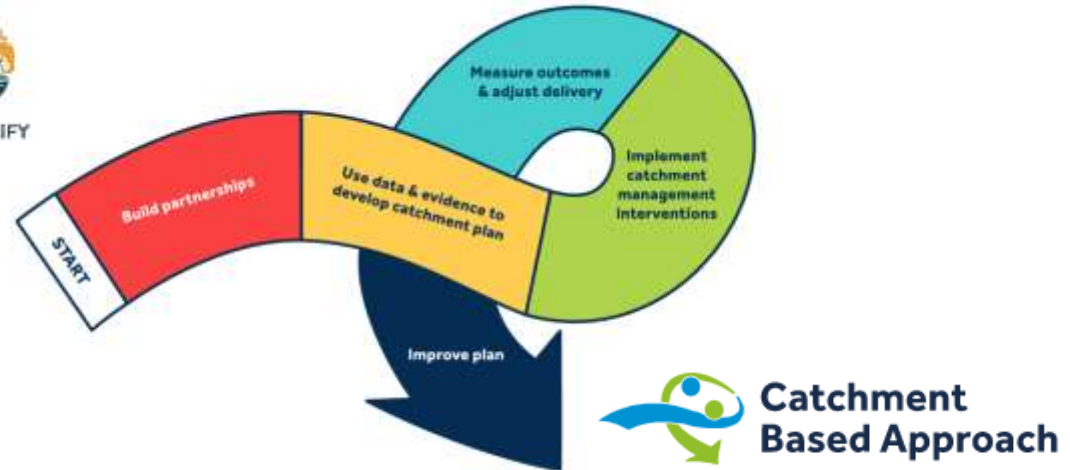
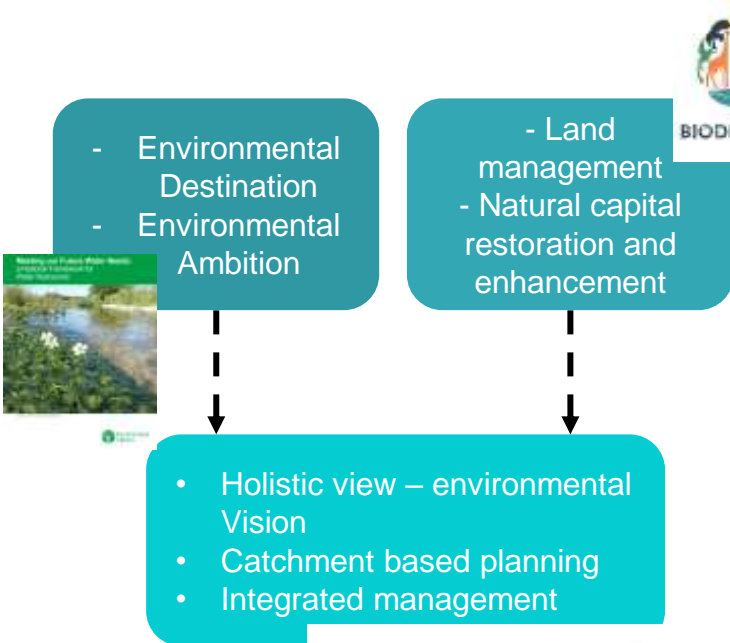
Environmental
Ambition

Land management

Natural capital
restoration and
enhancement

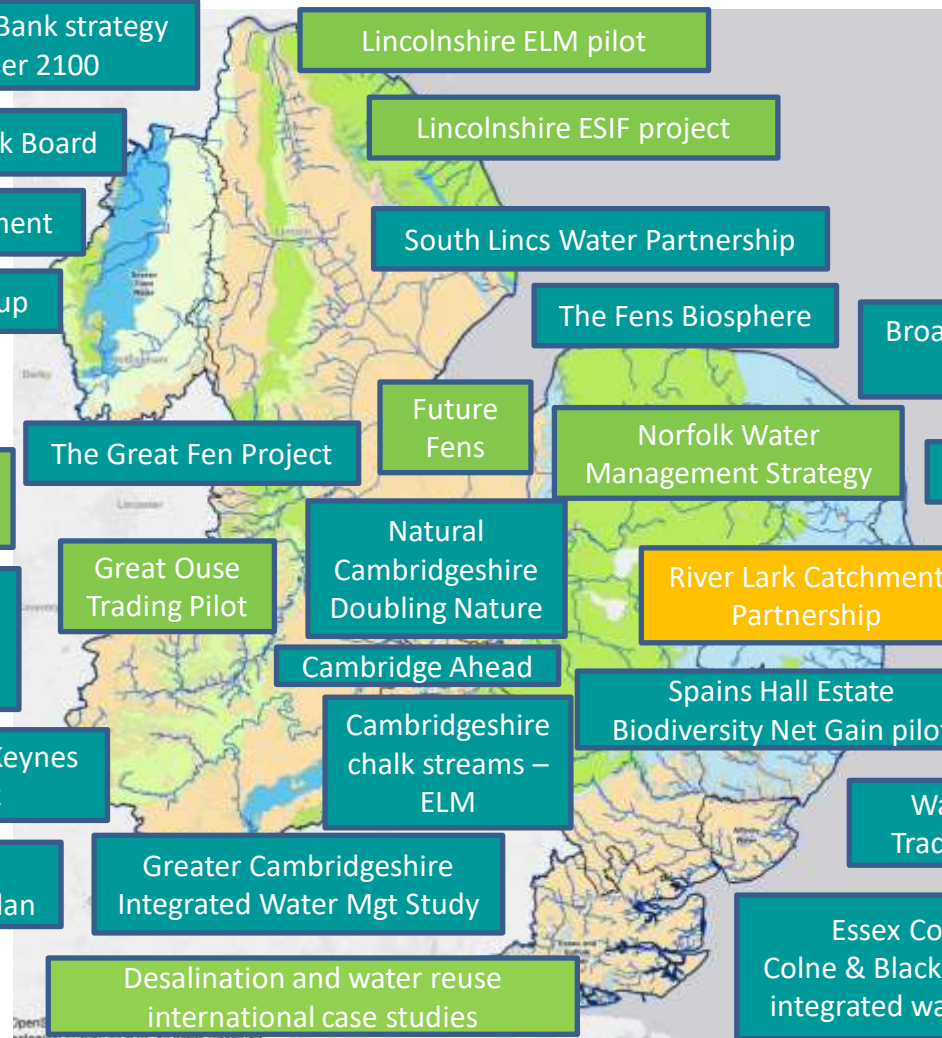
- **Environmental Destination:** ‘The reductions needed to ensure abstraction is sustainable, now and in the future (2050).’
- **Environmental Ambition:** ‘The rate at which the reductions in abstraction (defined by the environmental destination) will be delivered.’
- **Over-arching environmental vision:** ‘A broad, long-term vision for the environment in the WRE region that considers water and land-management holistically.’

Taking a catchment based planning approach



Where can WRE add value and provide facilitations?

- Cross-sector collaboration
- Awareness of challenges / opportunities
- Finding solutions
- Delivery routes and managing change
- Funding



South Humber Bank strategy and Humber 2100

Lincolnshire ELM pilot

North Lincolnshire Flood Risk Board

Lincolnshire ESIF project

Idle and Torne Priority Catchment

South Lincs Water Partnership

River Trent Working Group

The Fens Biosphere

Multi Objective Robust Decision Making

Broadland Catchment Partnership

Water efficiency innovation and exemplars

Integrated Environmental assessment

The Great Fen Project

Future Fens

Norfolk Water Management Strategy

Hydrogen East

'Water For Tomorrow' The Broads East Suffolk Rivers CamEO

Golf and wider leisure sector demand management

Great Ouse Trading Pilot

Natural Cambridgeshire Doubling Nature

River Lark Catchment Partnership

Suffolk Holistic Water Management

East Suffolk Catchment Partnership

The Bedford Milton Keynes Waterway Park

Cambridge Ahead

Cambridgeshire chalk streams – ELM

Spains Hall Estate Biodiversity Net Gain pilot

Water Source Trading Platform

Systematic Conservation Planning

Ox Cam Arc Natural Capital Plan

Greater Cambridgeshire Integrated Water Mgt Study

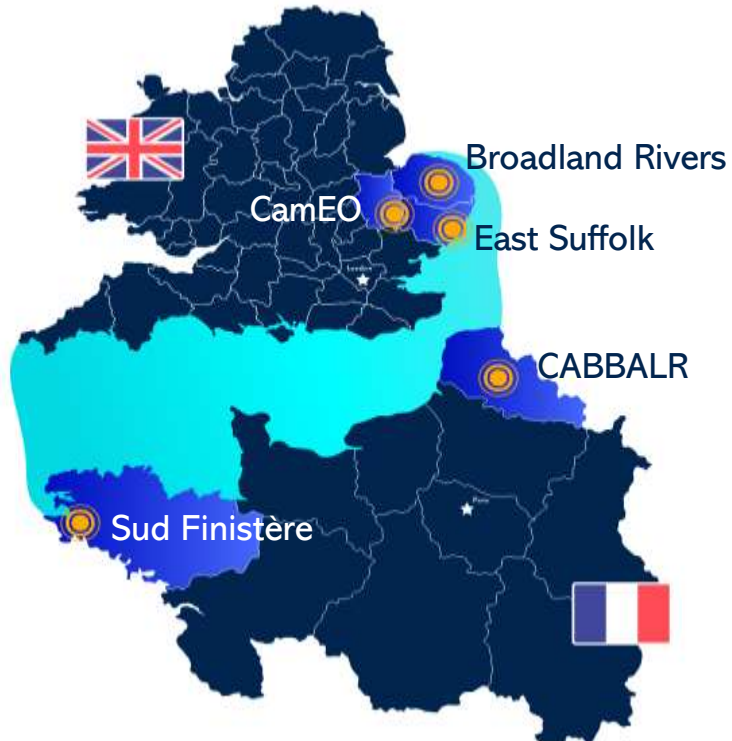
HR Wallingford research programme

Desalination and water reuse international case studies

Essex County Council Colne & Blackwater catchments integrated water management

Exemplary Water Communities

Water for Tomorrow



- **WRE are leading on the technical aspects of the project:**
 - **Water Resources Modelling**
 - **Options Development**
 - **Decision Support Modelling**
- **Will all feed into the new Catchment Management System for the EN pilot catchments.**

Improving the resilience of chalk streams



HR Wallingford



NORFOLK RIVERS TRUST



WATER RESOURCES EAST



Cam Valley Forum

Protecting and enhancing the environment of the river Cam and its tributaries.

Let it Flow!

Proposals from the Cam Valley Forum for an Integrated Water Resource Management Plan for the Cam Valley

THE PROBLEM NOW: Examples of Cam Valley Chalk streams silted out by over-abstraction:



River Granta at Soperford, September 2019



Granta tributaries in Barton Marsh, August 2020

OUR AMBITION: Examples of Cam Valley Chalk streams as they should be:



River Great Ouse, Frodochov, May 2020



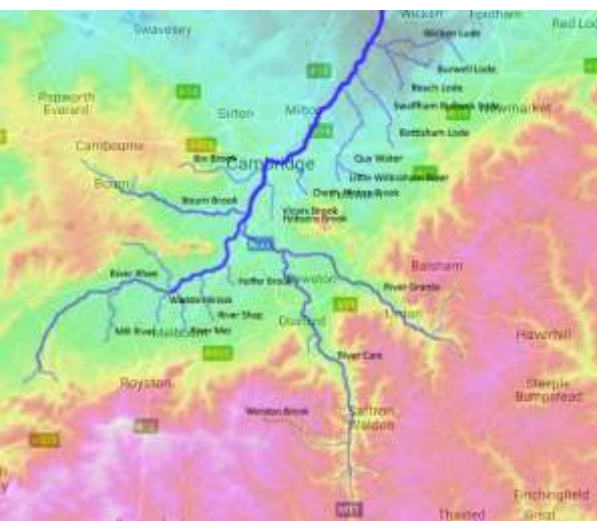
River Stog at Water Park, July 2022

"We need a national programme in place for the next generation. By implementing the measures in this ambitious plan, each year between the 2013 generation to those that will live in a better world than we live in today will pass on to the next generation a natural environment protected and enhanced for the future."

Prime Minister's Foreword by a Green Future: Our 25 Year Plan to Transform the Environment



Catchment Based Approach
Chalk Stream Restoration Strategy 2021
Main Report
100 pages, 100 photos



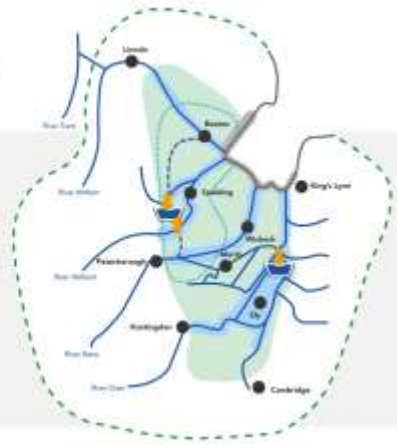
The River Lark Catchment Partnership

Environmental Land Management

Future Fens Integrated Adaptation Strategy

FUTURE FENS: INTEGRATED ADAPTATION

Taking a holistic, multi-sector approach to adaptation



-  New reservoir intake
-  New flood risk management strategy
-  Adaptive plan for The Wash
-  Landscape boundary within which water strategy will be aligned with land use management (i.e. National Flood Risk Management and Environmental Land Management Strategy)
-  New open water transfers
-  New reservoir (indicative location)
-  Boston to Peterborough wetland corridor



WATER RESILIENCE

Reimagining the future of water: how landscape-scale solutions will win the race to water resilience

5 November | 13:00-14:30 GMT Resilience Hub, Blue Zone, Glasgow SEC and online via cop-resilience-hub.org



Dr Kate Valtersma-Booth | Rt Hon Steve Barclay MP | Emma Howard Boyd CBE | Naveen Dubeyan | Julia Fisher | Dr Hua Li | Professor Madhusudan Subedi | Peter Simpson | Tara Jenkins CBE

The Norfolk Water Management Plan

Water Funds: a tested approach for investing in watershed services where collective action is needed



Norfolk County Council



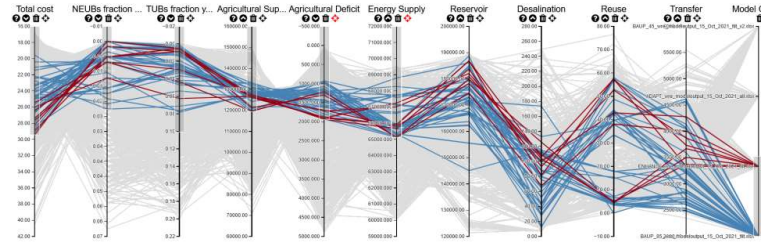
All water funds share some characteristics:

- (1) Science-Based Plan
- (2) Multi-stakeholder Governance
- (3) Long-term Financing
- (4) Implementation Capacity

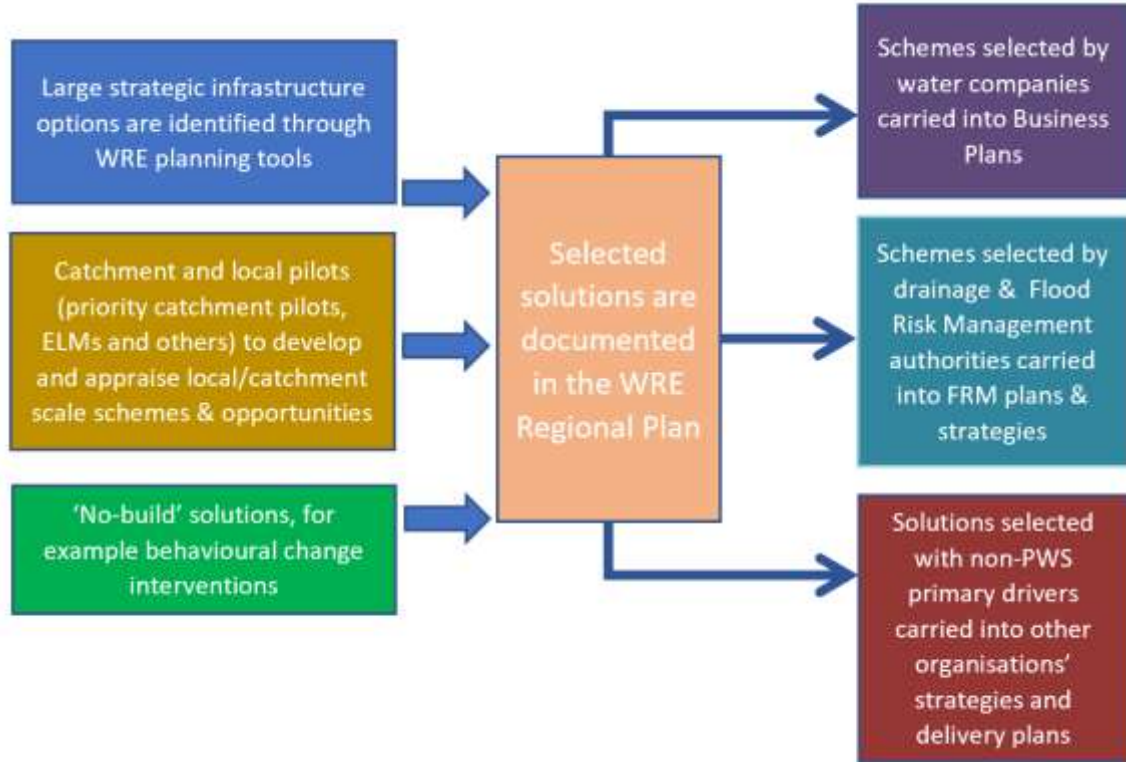
Over last 15 years, TNC helped establish ~ 30 Water Funds and supporting many more



Innovation around financing and delivery of supply-side infrastructure (large and small.....)



Model Outputs
 ADAPT_95_wre_modeloutput_1... ADAPT_wre_modeloutput_15... ADAPT_95_wre_modeloutput_1...



Our draft Regional Plan – water efficiency and demand management approach



Now to 2025

Water company delivery (eg demand management such as PCC, leakage reduction)
Identification of multi-sector, non-household exemplars, and development of a collaborative strategy

2025 to 2030

Significant focus on HH and NHH water efficiency and demand management, particularly smart metering, leakage <10%
Innovation around tariffs
Focus on water sharing/trading opportunities using international learning
Delivery of multi-sector, non-household water efficiency approaches
Delivery of a long-term approach and trajectory

2030 onwards

Continued focus on water efficiency and delivery of a long-term approach

Our draft Regional Plan – ‘supply-side’ strategy

2025 to 2030

Now to 2025

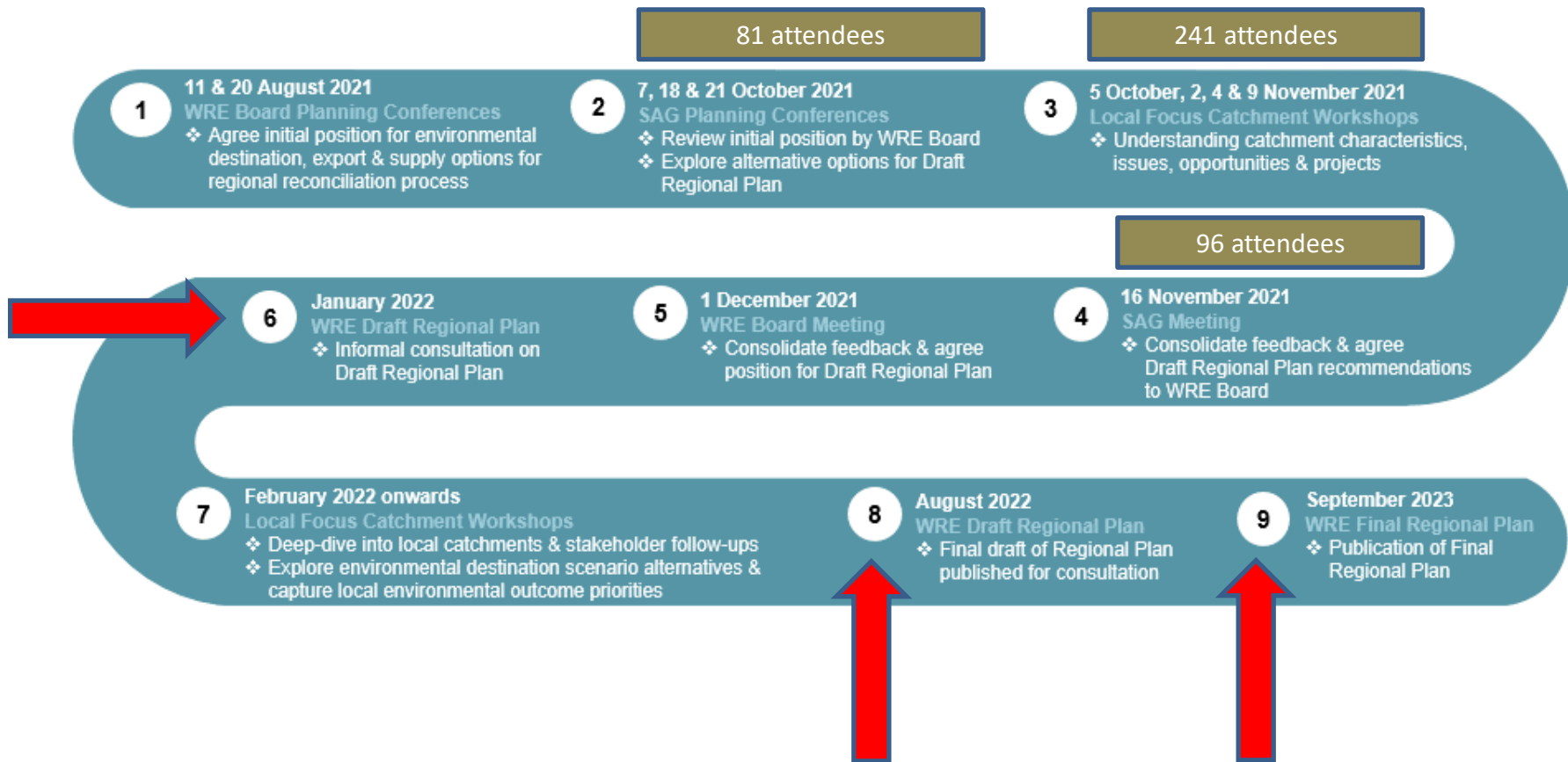
Focus on
immediate
abstraction
hotspots around
chalk streams and
The Broads
Next generation
desalination R&D
Strategic
reservoir design
and planning
Local
infrastructure
studies

Strategic reservoir system construction
Intermediate solutions eg Anglian to
Cambridge transfers
First re-use schemes and next
generation desalination, linked to green
hydrogen pilots
Aquifer storage and recovery (ASR) pilot
(Sherwood sandstone)
Local multi-sector infrastructure delivery
(equal mix of green and grey?)
Catchment investigations and planning
(linked to environmental vision)
Development of further strategic storage
options and potential transfers through
Regional and National planning

2030 onwards

Strategic reservoir systems
into supply
Wider re-use and next
generation desalination
options, including for public
water supply?
ASR implementation
Wider green hydrogen
implementation
Significant delivery of
further multi-sector local
infrastructure (more green
than grey?) linked to
catchment plans

Our Engagement and Planning timeline





WATER RESOURCES EAST

To work in partnership to safeguard a sustainable supply of water for the East of England, resilient to future challenges, and enabling the area's communities, environment and economy to reach their full potential.

THE WATER RESOURCES EAST MISSION



Jobs ▾

Water Resources East

Worldwide



WATER RESOURCES EAST

Water Resources East

Nonprofit Organization Management

Norwich, England · 738 followers

WRE is pioneering an innovative, collaborative approach to resilient water management in Eastern England

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615 Tweets



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robinprice@wre.org.uk
contact@wre.org.uk