

## Project background, purpose, approach and conclusions



### Overview

Current approaches to statutory water planning for each water discipline (or sub-system) identify and select investments/interventions largely in isolation. This is a (comparatively) simplistic way of doing things and inhibits the realisation of efficiencies and opportunities to deliver more for the water environment. The established approach doesn't allow for the whole value of each proposed intervention to be recognised during the selection process.

Phase 1 of the Oxford to Cambridge Integrated Water Management Framework (IWMF) Programme assessed generic intervention types and determined that they have the potential to provide significant secondary (multiple) benefits to other water functions. The benefits of an intervention can therefore often be greater, and broader, than currently recognised. This provided baseline

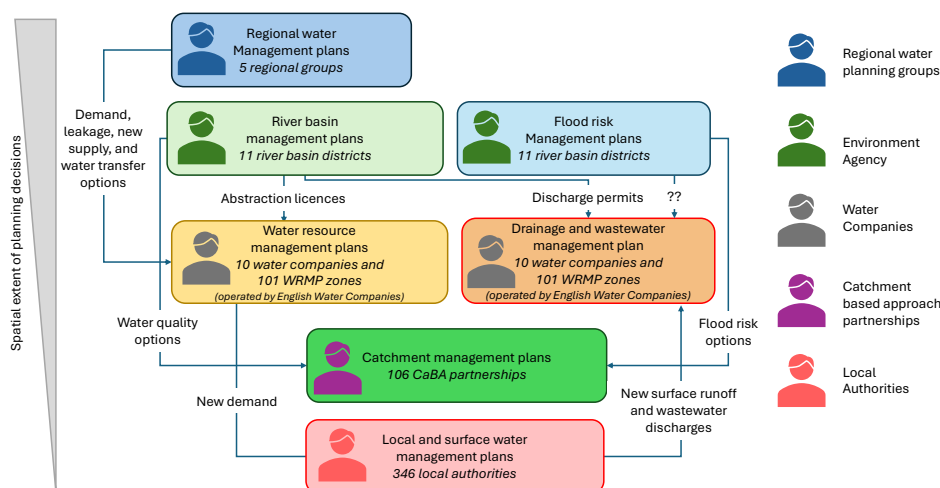
evidence that there is theoretical value in considering 'multiple benefits' when deciding on investment.

To fully plan for, and realise, the value of these secondary benefits, we hypothesised that there needs to be greater coordination across statutory water plans. This goes above and beyond the current way of working. This project therefore intended to build on the theoretical outputs of IWMF Phase 1 to determine/demonstrate the potential to realise greater benefits to the water system by designing approaches that employ coordination across water planning and practically testing/applying these approaches in a place (using existing, actual plans).

Integrated Water Management Framework (IWMF) Programme



#### High level view of interdependencies in water management planning frameworks



## Objectives

- To demonstrate the value of a coordinated approach to statutory water planning across disciplines through test and trial application in a place (using live plans).
- To build on the theoretical value of considering ‘multiple benefits’ when deciding on investment/interventions.
- To build evidence that could be used as part of a business case for change to inform future ways of working (changing the way investment decisions are currently identified, prioritised, and delivered).
- To demonstrate the benefits of greater coordination by bringing together intervention selection for two or more of the water disciplines (the four water disciplines or sub systems for this project are: water quality, water resources, flood risk and water environment).

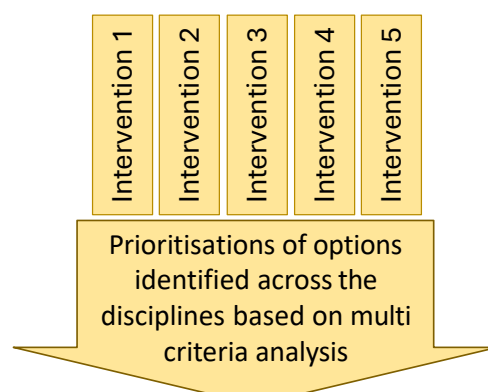
## Outputs and outcomes

- A number of approaches, designed in detail, that could be employed to bring together investment planning processes across water disciplines, allowing statutory water plans to be better aligned and to work more effectively together.
- Demonstrable evidence (either qualitative or quantitative) of the value of the new/alternative approaches through place-based (specific, real, tangible examples) testing/trialling – by applying the theoretical outcomes of Phase 1 through case studies (which will be either wholly, or partially within the Oxford to Cambridge area).
- An appraisal of the effectiveness of these designed approaches against current (BAU) ways of working.
- Comparison of the proposed portfolios against each other and current ways of working (BAU).
- We aimed for the evidence produced in this project to be used by the Environment Agency, Defra and Water Company staff as an example of how statutory water planning could be transformed. The approaches were not expected to be perfect, however we hoped for elements of them to be considered for further development.
- Build an evidence base to demonstrate a change in approach, allowing the Environment Agency to inform future ways of working, to ultimately support achievement of our environmental ambitions and 25 Year Environment Plan (YEP) goals.

### Current Planning Arrangement (Business as usual)



### New approach to water planning



Demonstration of the value of taking a new approach:

- Environment
- Economic

Full portfolio of interventions

Proposed alternative portfolio of interventions

## Defining our project

The project team decided to demonstrate the value of bringing together existing plans by testing two approaches, both of which aimed to bring together all four of the water disciplines.

The decision was taken to work in parallel to live plans, as a proof of concept, rather than to work with and seek to actively influence live processes. The reasons behind this decision were:

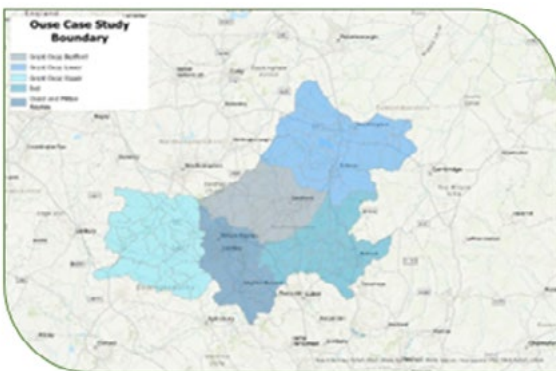
- To work/progress at speed, and not be constrained by external timelines or reliant on the resource of external organisations.
- To be able to make assumptions where appropriate (this may not have been possible in a live process).
- To demonstrate the process to build buy-in/gain support from stakeholders without their need to invest in or commit to the process.

## The test and trials

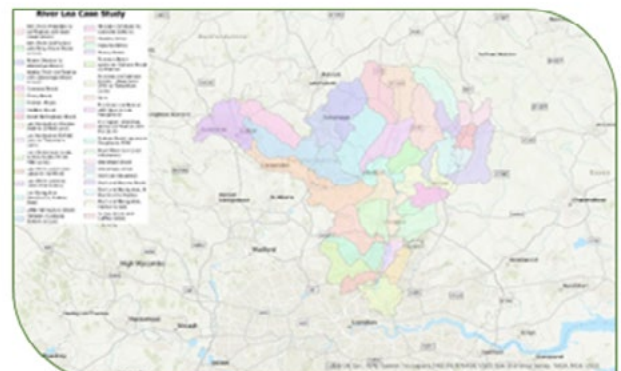
### Approach 1

Systems approach to Integrated Water Management (SIWM)

#### Non-tidal River Great Ouse



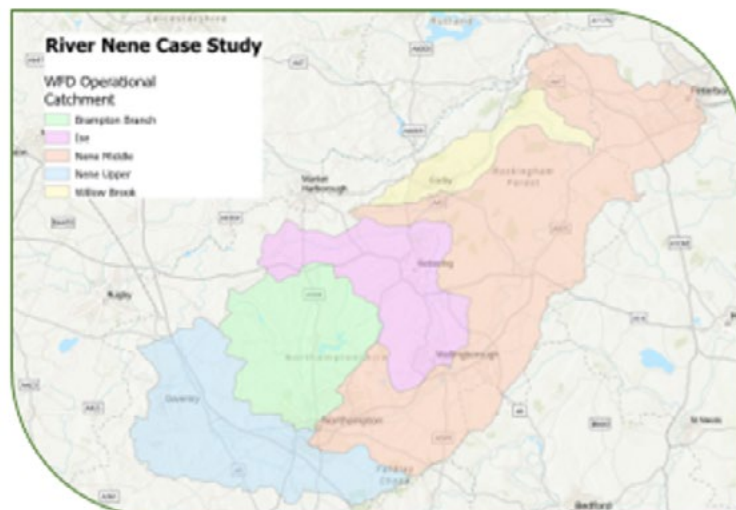
#### River Lea



### Approach 2

Options-based Catchment Reconciliation

#### The River Nene



## Application of these approaches

These approaches have been designed to be undertaken before, or as part of, the development of a major new strategic plan. To effectively integrate the different water disciplines this 'live' approach would need to be run at regular intervals and considered each time one of the following 'core plans' is reviewed and updated. To be successful the responsible authorities of these four core plans would need to commit to this process:

River Basin Management Plan (RBMP)	Environment Agency
Water Resource Management Plan (WRMP)	Water Company
Drainage and Wastewater Management Plan (DWMP)	Water Company
Flood Risk Management Plan (FRMP)	Environment Agency

To add extra value, in addition to these core plans, it is recommended that additional plans are considered for inclusion where possible. For example: Local Planning Authority (LPA) local plans; Local Planning Authority Local Flood Risk Management Strategies; Water Industry National Environment Programme; Catchment Partnership Plans; and Surface Water Management Plans.

While providing additional benefits, it was determined that this list of 'additional' plans are not essential to the overall approach because the four core plans are the main drivers for change to the water environment.

## Geographical locations/scale

These approaches rely on using waterbodies as the base geographical unit, river basins or large sub-catchments are therefore the ideal geographical boundary to work with. An additional benefit of working at a river basin scale is that the Environment Agency develops its RBMPs and FRMPs at this scale.

There were some considerations to be thought through before we decided to work at this scale:

- Water company supply boundaries generally extend beyond catchment boundaries.
- Each river basin can cover multiple LPAs and their plans.
- Stakeholders might straddle two or more river basins, meaning that they would need to participate in multiple processes.

- Catchment boundaries do not always align with groundwater aquifers, which are particularly important with regards to water resources planning.
- Drainage and wastewater catchments boundaries align well with river catchment.
- Whether to include tidal limits or exclude them to stay within freshwaters.

Despite the challenges listed above we continue to believe that this is right geographical study area scale. Working at any other scale would have greater challenges because waterbodies are the required building block for both the integrated modelling and the catchment reconciliation methods.

## Who would lead on the process?

The ideal scenario would be leadership through a centrally funded integrated planning office, servicing all key stakeholders. However, in lieu of this it is expected that the lead organisation would differ based on the location, scale, interest, where stakeholders are in their planning cycle, and available resources.

Large catchments with complex trade-offs would benefit from being led by a 'strategic partner/stakeholder' with an interest in multiple aspects of the water system, for example regional planning groups, water companies, combined authorities, pan regional partnerships, or large catchment partnerships.

Roles and responsibilities would require careful consideration before this approach could be taken forward as part of a live 'real world' trial.

## Project Conclusions

This project has tested/trialled two different approaches to integrating the statutory water planning functions. Neither are perfect, but they do provide a useful evidence base and a basis for alternative proposed approaches to be built on.

The project had to find the balance between trying to cover multiple aspects of water, over a large area, and the resource demands that come with different levels of detail. We accepted that this type of multi criteria review and option selection would not therefore have as much confidence as the sector specific modelling that is undertaken. As a consequence, identifying the right place to input these approaches into the process, (likely in an iterative way) with the detailed optioneering work is critical.

Creating combined portfolios is difficult. We were unable to determine the true value of a combined portfolio in this project due to:

- Lack of cost information for the measures
- Lack of measures that were able to be individually considered (we grouped measures for ease of modelling or excluded them when they were not able to be defined in the modelling)
- Insufficient resource to deliver multiple iterations to identify the best portfolio

Further work needs to be undertaken on how jointly agreed measures can feed into statutory investment plans. Consideration needs to be given to allowing the ‘best for nature’ choices to be made rather than necessarily the ‘greatest value for an individual water discipline’.

The project found it very difficult to define the baseline. This was because of the lack of available data for all interventions being planned and delivered in each catchment. Further work needs to be done on split funding of options.

Approach 1 allowed for the scaling of measures, however scaling measures and not providing a quantified assessment undermined the capability to make a robust selection of a catchment portfolios in Approach 2.

Across the approaches there were clear indicators that most measures had benefits outside of their ‘core’ function.

The metrics used across the approach were not able to determine if core needs were being met, e.g. public water supply or moving properties down flood risk bands. There remains a need to determine the best way to manage and plan this integration. This will continue to need to flex due to the misalignment of planning cycles. They are currently every six years for RBMPs and FRMPs, and every five years for DWMPs and WRMPs. Consequently, in each cycle, each plan will be at different points in relation to each other.

The participatory systems mapping element of both case studies demonstrated the complexity of the water system. It also begins to explore how decisions on housing growth, development location, and associated infrastructure are intrinsically linked to our water environment. The method is beneficial in increasing greater awareness of the system as a whole for all stakeholders and can also be used at a site level.

More work needs to be undertaken across the water industry and with other plan makers to enable the evidence bases and optioneering are consistent and shareable.

Given the comparatively moderate costs of undertaking numerical modelling, and the advantages this modelling brings we consider approach 1 (Systems approach to Integrated Water Management) to be a more effective tool than approach 2 (Options-based Catchment Reconciliation).

## Project Recommendations/Actions

A round of integrated water planning should take place after publication of WINEP in Q1 2024 (2029, etc), at which point WRMP and DWMP options will also be most up to date. To include a diverse range of stakeholders, IWM engagement should avoid taking place during the finalisation of WRMP or DWMP processes where water company stakeholders are likely to be too busy to participate.

Further investigation of the links between low flows and water quality in the development of integrated water planning should be made, drawing on the results in the River Lea in this study. The investigation should identify how to mitigate potential deterioration of water quality where reductions in the discharge of treated effluent is achieved.

Environmental Flow Indicator flow duration curves should be published for all water bodies by the Environment Agency.

RBMP, WINEP and DWMP options should be tabulated in a similar way to WRMP options, including costs. A live register should be published and maintained for all catchment, WINEP and flood risk options.

Water quality monitoring of rivers should increase in frequency and spatial extent, to enable better understanding of river health and its driving pressures.

Options should be modelled in isolation to determine precise causes and effects where impacts on metrics are significant.

# The project

## Project background and purpose



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approach and conclusions



## Techniques applied in the trials



Integrated Modelling summary



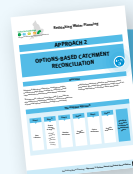
Participatory Systems Mapping



## Trialling ways to achieve the ambition



Approach 1: Systems  
Approach to Integrated Water  
Management (SIWM)



Approach 2: Options-Based  
Catchment Reconciliation

