Natural Course

Natural Capital Conference

24th & 25th April 2023

Welcome To Manchester

Craig Higson – Natural Course Programme Manager

Agenda

Trialling a Natural Capital approach to fund and deliver environmental benefits.

Venue: The Clayton Hotel (Piccadilly Room)
55 Portland Street, Manchester, M1 3HP

Agenda Day 1: Tuesday 25th April

Time	Title	Speaker
09.00 – 10.00	Arrival & registration	
10.00 – 10.15	Welcome and opening address from Natural Course	Craig Higson
10.15 – 10.30	Introduction – Why we are interested in Natural Capital and how it has been applied to the sector	Krista Patrick
Building the Natural Capital evidence base		
10.30 – 11.00	The Ecological Network Tool - using spatial modelling to identify priority areas for biodiversity and Natural Capital across the North West River Basin District	Tom Smart
11.00 – 11.20	Coffee break and networking	
11.20 – 11.50	Understanding Ecosystem Services opportunities and Natural Capital accounts in Greater Manchester	Krista Patrick
11.50 – 12.20	Flood and Coastal Risk Management opportunities in the Northwest	Bruce Munro and Will Maclennan
12.30 – 13.30	Lunch and networking	
Stakeholder engagement with Natural Capital		
13.30 – 14.00	A BRILliant action plan: Bringing the River Irk to Life	Charlotte Sugden and Anne Harding
14.00 – 14.30	Using Natural Capital Farm plans as a catalyst for engagement with landowners	Petula Neilson
14.30 – 15.00	The Catchment Based Approach	Rob Collins
15.00 – 15.20	Coffee break and networking	
Site visit		
15.20 – 16.00	An overview of the Mayfield Park development and Natural Capital benefits	Helen Telfer
16.00 – 16.30	Walk to Mayfield Park	Mark Turner
16.30 – 17.30	Guided tour of Mayfield Park	Laura Percy Dave Barlow
17.30 – 18.00	Walk back to Clayton Hotel	
19.30	Evening Meal at the Clayton Hotel	

Natural Course LIFE IP

A 10-year 20m euro EU funded collaboration project involving private and public sector and Non-Governmental Organisations

Delivering innovative projects, designed to understand and overcome some of the biggest barriers to the EU Water Framework Directive in North West England:

to improve the health of our rivers
to build capacity
to support river basin management planning
to deliver multiple benefits

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Environment Agency
GREATER MANCHESTER – DOING THINGS DIFFERENTLY
NATURAL ENGLAND
The Rivers Trust
United Utilities – Water for the North West
Life

Natural Course LIFE IP

We work in collaboration:
Co-location
Co-design
Co-funding and
Co-delivery

Our projects are themed around:
Water governance
Diffuse pollution
Natural Capital
Catchment Understanding
Nature Based Solutions

Project location

Cheshire
Cumbria
Greater Manchester
Lancashire
Merseyside

12 Management catchments
43 Operational catchments
632 Waterbodies
13,200Km^2
Rural and Urban
7 Million population
80% of land used for agriculture

Phase 4 project list

North West River Basin District:

- Ecological Network Tool (NE)
- Enabling citizen science (RT)
- Flood and Coastal Risk Management opportunity tool kit (EA)
- Macro plastics in the North West River Basin District (EA)
- Mobilising water industry investment (UU)
- Support for catchment partnerships (EA)
- Use of tools and data (RT)

Greater Manchester, Merseyside and Cheshire:

- Cheshire Hub (UU)
- Greater Manchester River Ecology project (GMCA)
- Improving Urban Planning's contribution to RMBP delivery project (GMCA)
- Innovative financing, using a natural capital approach to generate investment (GMCA) *
- Micro plastic pollution in Greater Manchester (GMCA)
- Urban diffuse pollution (GMCA)
- Using Local Nature Recovery Strategies to deliver Water Framework Directive objectives (NE)
- Wider engagement across Greater Manchester on how to embed a natural capital approach (GMCA)

Cumbria and Lancashire:

- Fylde Hub (UU)
- Innovative financing, using a natural capital approach to generate investment (GMCA) *
- Reaching 'High Ecological Status' on the River Irt (EA)
- Water Governance (EA)

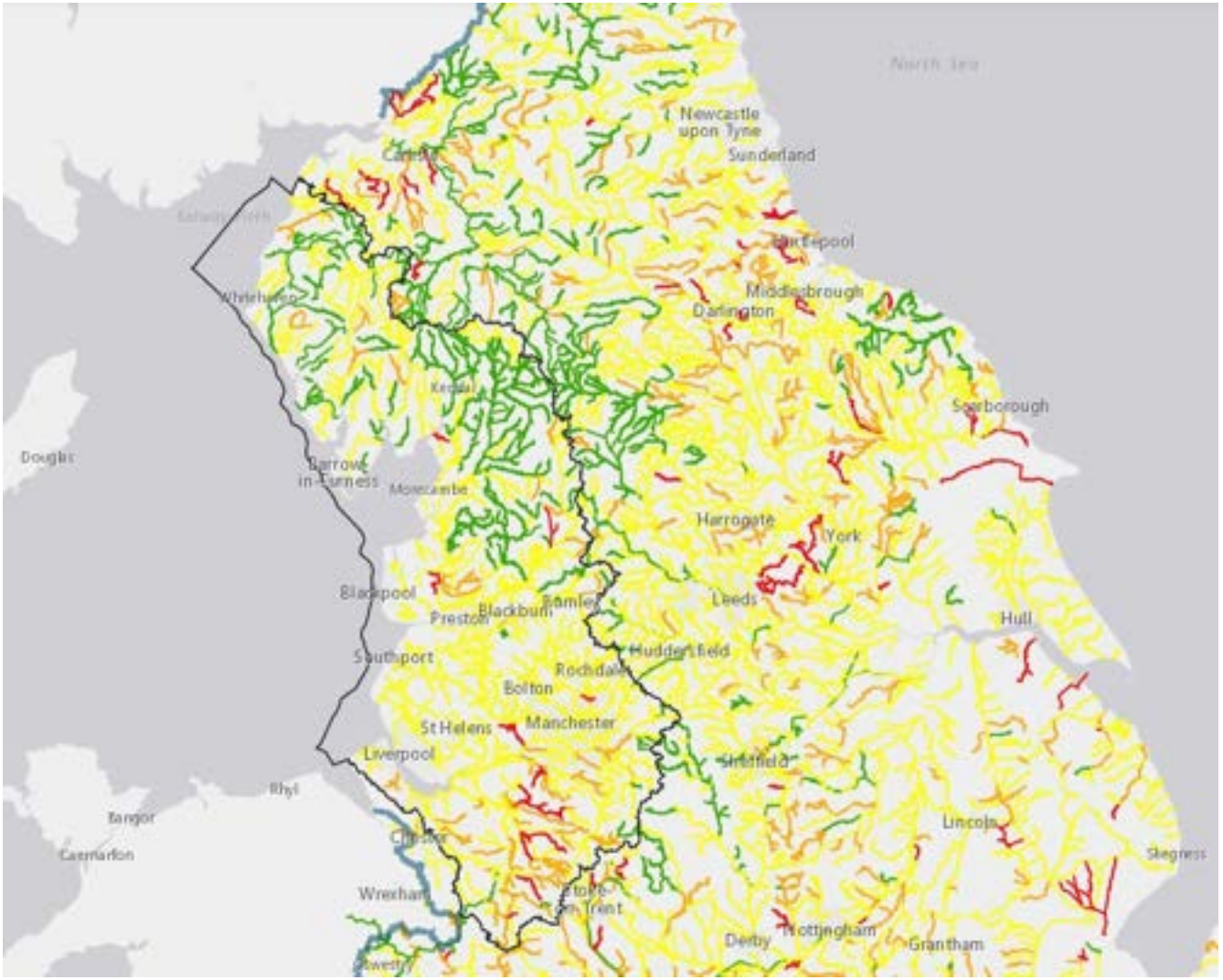
The North West River Basin District

An area of contrasts

The North West River Basin District

An area of contrasts

The North West River Basin District



The North West River Basin District

Ecological status for surface waters

Ecological status or potential	Bad	Poor	Moderate	Good	High	Total
Number of water bodies	17	61	390	130	1	599

Challenges for our Rivers

Artificial / Heavily modified waterbodies

Pollution from agriculture and rural areas

Pollution from waste water

Pollution from towns, cities and transport

Plastics pollution

Invasive non-native species

Pollution from abandoned mines

Changes to water levels and flows

Too Much Water

Too Little Water

Natural Capital Approach

Thankyou

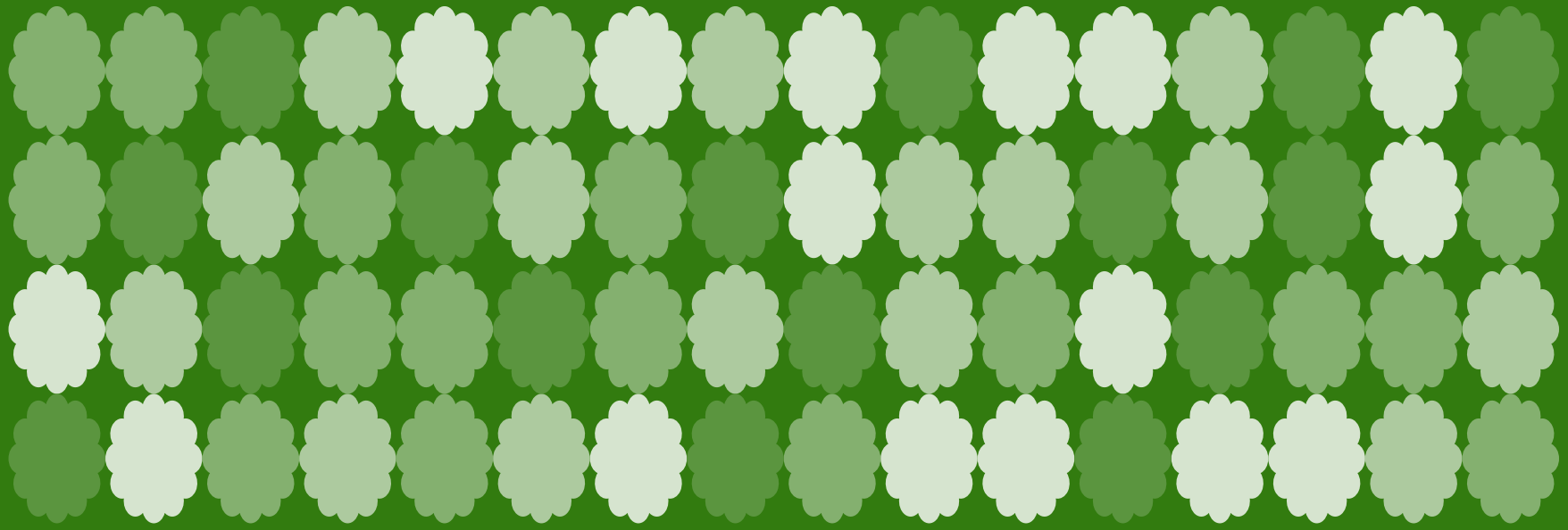
Enjoy the conference

Craig Higson

Natural Course Programme Manager

Why are we interested in natural capital?

Natural Capital Event 25th April 2023



What is natural capital?

"The natural environment provides people and economy with many different benefits"

Carbon capture

Flood risk management

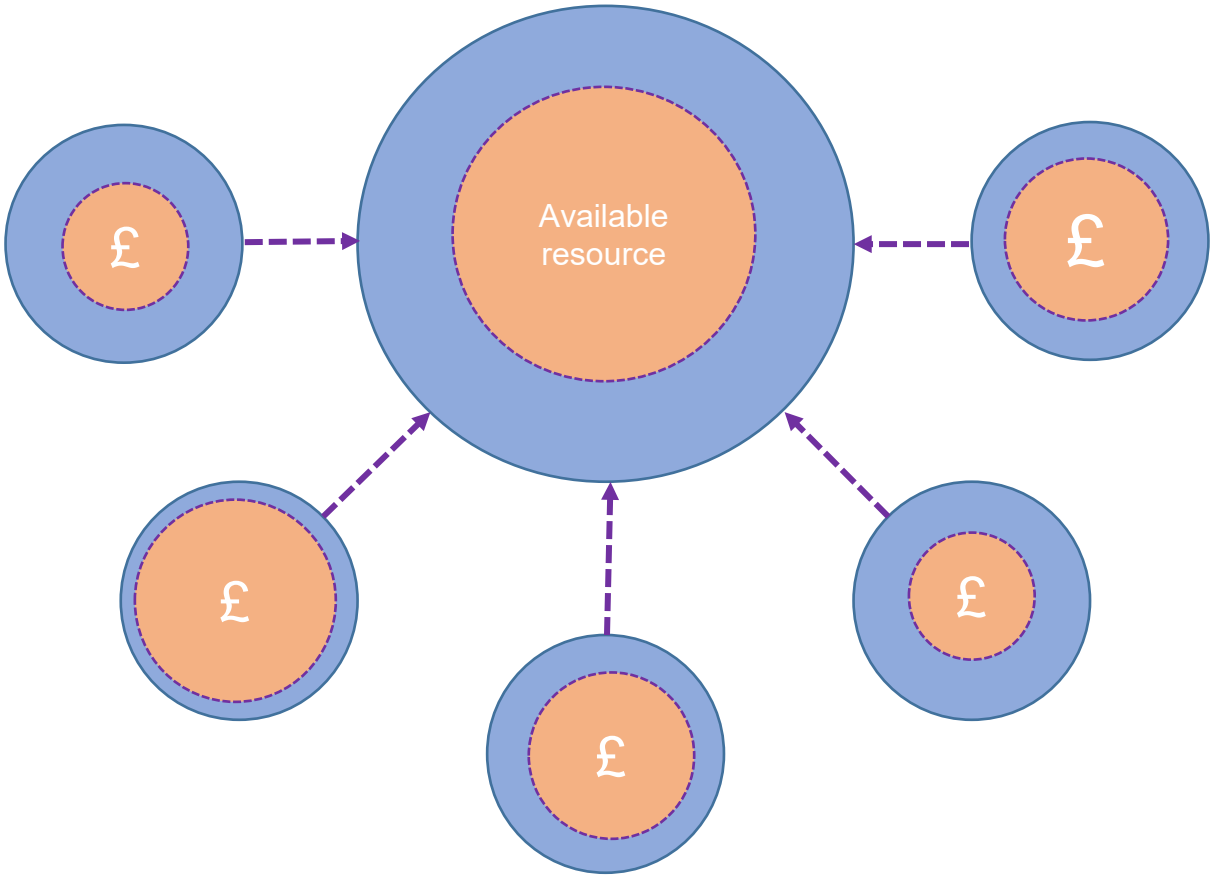
Recreational space

Using a natural capital approach

- The stock of the aspects of **UK natural capital** we are currently able to value was an estimated **£1.2 trillion** (2019)
- In terms of **climate change emissions alone**, of restoring 55% of peatlands to near natural condition were estimated to have a present value of approximately **£45 billion to £51 billion** (2019)
- The value of **health benefits** associated with outdoor recreation in the UK was estimated to be between **£6.2 billion and £8.4 billion** in 2020
- The extent of **UK urban environments increased 30%** between 1990 and 2019, while **enclosed farmland fell 5%**.

Illustration by Rachael Balsaitis
Source Ensia.com

Identifying synergies



Greater Manchester

Environmental challenges & ambitions

GM's 5-Year Environment Plan (5YEP) sets out an ambitious vision for a "clean, carbon-neutral, climate resilient city region with a thriving natural environment", and demands urgent action to achieve this.

Threats facing GM's natural environment…		…5YEP ambitions
Land	Unsustainable land management; GM accounts for 3.6% of the UK's annual CO_2 emissions	Plant 1m trees by 2024, 3m by 2035 Restore 50-75% of GM's peatlands by 2040 Carbon neutral city region by 2038
Water	Over 90% of GM's waterbodies fail to meet quality standards; over 50,000 properties at risk of flooding	Improve GM waterbodies to achieve standards by 2027; shift to more nature-based solutions for flood alleviation schemes
Biodiversity	Biodiversity net gain approach not yet adopted across districts; lack of green space and ecological networks	Embed biodiversity net gain for developments and accelerate the delivery of a GM Nature Recovery Network
Investment	Insufficient funding available to protect nature; lack of business models to attract alternative sources	Develop GMEF to broaden the range of funding sources; deliver investment readiness support and proof-of-concepts
Environment engagement	Lack of public recognition of the wide range of benefits that nature delivers for the economy and society	Widen engagement via volunteering and employment opportunities; build on evidence base to promote benefits

The Covid-19 pandemic has increased the importance of delivering on these ambitions to boost the local economy, create jobs, increase climate resilience and enhance the wellbeing of GM's residents.

Strategic direction

Priority 1:
Managing our land sustainably

Priority 2:
Managing our water and its environment sustainably

Priority 3:
Achieving a net gain in biodiversity for new development

Priority 4:
Increasing investment into our natural environment

Priority 5:
Increasing our engagement with our natural environment

Our natural capital journey

Building political and stakeholder support — *2016-2018*

- GM Natural Capital Group provides environmental leadership
- Raising awareness of environmental issues and benefits
- GM selected as the "Urban Pioneer" by Defra tasked with testing new tools for natural environment investment
- Baseline natural capital accounts
- Development of evidence base to inform strategic priorities
- Events promoting connection with nature
- Start demonstrator projects to evidence benefits and test new approaches
- Mayoral commitment to GM Green City and set up of GMEF
- Securing resources to trial new approaches

Strategic plan — *2018 - 2019*

- Environmental priorities
- GM 5 Year Environment Plan
- Investment opportunities
- Resourcing and capacity building requirements
- Natural Capital Investment Plan

Design of delivery model — *2020*

- Design and structure GMEF
- Appoint GMEF Manager
- Set up charitable vehicle and governance
- Identify pilot projects
- Pump-priming grants and implementation funding

Launch and deliver GMEF — *2021*

- Launch GMEF
- Implement pilot projects
- Monitor and showcase success
- Scale up funding

GMEF
GREATER MANCHESTER ENVIRONMENT FUND

To build a structure of this scale, pump priming grants are required to bring in much needed development capacity to launch GMEF, implement pilot projects and showcase the benefits that GMEF has to offer.

Valuing our natural environment

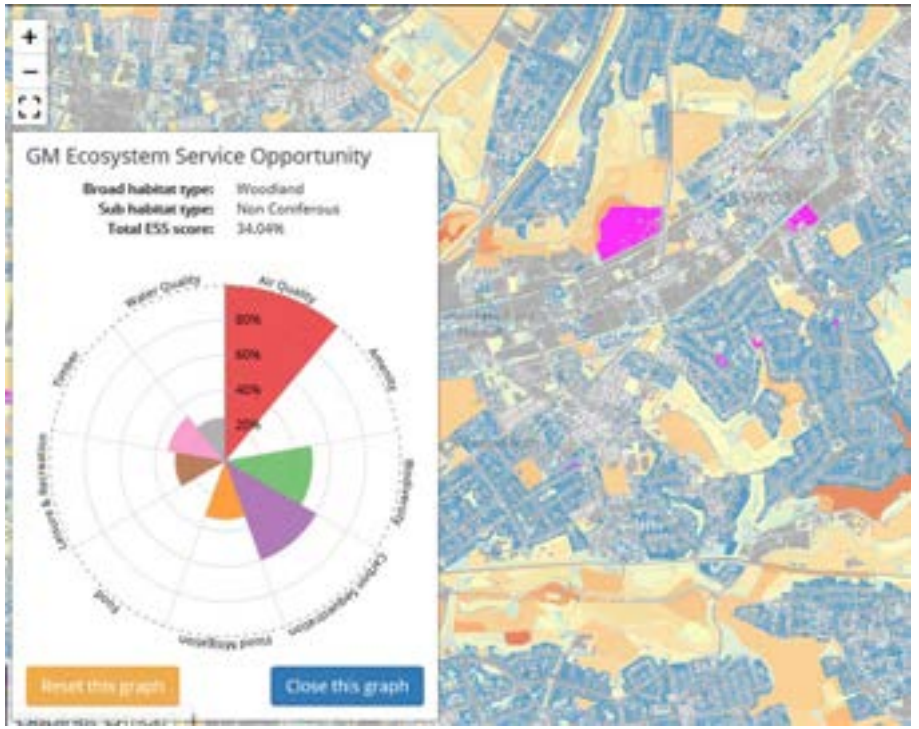
£1bn - total annual benefit

£9bn – total value of avoided healthcare costs (over 60 yrs)

- Preventing **370** hospital admissions, avoiding **1,200** life year's lost
- Approx. **44,000** buildings receive noise mitigation
- **135,000** people meet their physical activity guidelines, giving over **4,600** QALYs

Mapping our natural environment

- Water Quality
- Flood Mitigation
- Recreation, Physical and Mental Health
- Amenity
- Carbon Sequestration
- Biodiversity and Ecological Networks
- Air Quality



Natural Capital Investment Plan

The investment plan aims to support the agreed vision of:

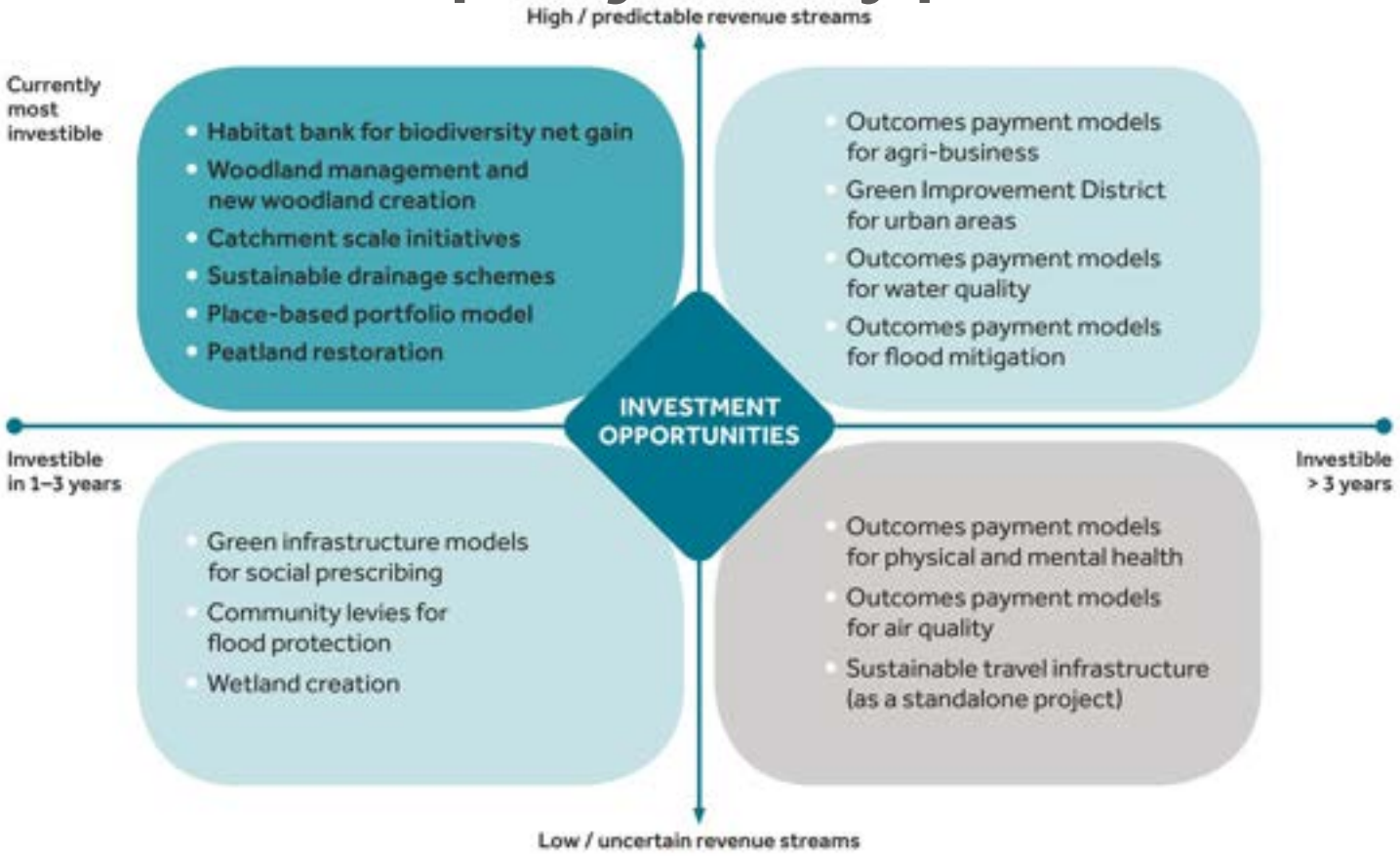
"A Greater Manchester where investments in natural capital enhance the long-term social, environmental, and economic health and wellbeing of its people and businesses."

Investment in natural capital defined as:

"Funding that is intended to provide a return to the investor while also resulting in a positive impact on natural capital."

- Returns are defined predominantly, although not exclusively, in financial terms.
- Public and third sectors still have an important role to play, as enablers and innovators.

Pipeline of project types



Opportunities

- Natural Capital approach provides a unique opportunity to protect and enhance the environmental quality and resilience of the conurbation.
- Partner collaboration is key to progressing projects that enhance and protect our natural environment as well as ensuring the region is prepared for climate change.
- Opportunity to develop sites in a new and different way e.g. using more SuDS in areas where there is a high risk of surface water flooding.
- Building a business case for investment in natural capital and market development for nature based solutions.

Challenges

- Creating a natural liveable city region – how do you deliver at a GM scale and how do you monitor this?
- Language a key issue as general public relate more to cleaner, greener and healthier GM rather than investing in natural capital.
- Need to build on the evidence base to fill the gaps, avoid duplication and maximise the benefits.
- Future funding and identifying potential investment opportunities particularly through private sector investment.
- Skills and expertise required to deliver future nature based solutions.

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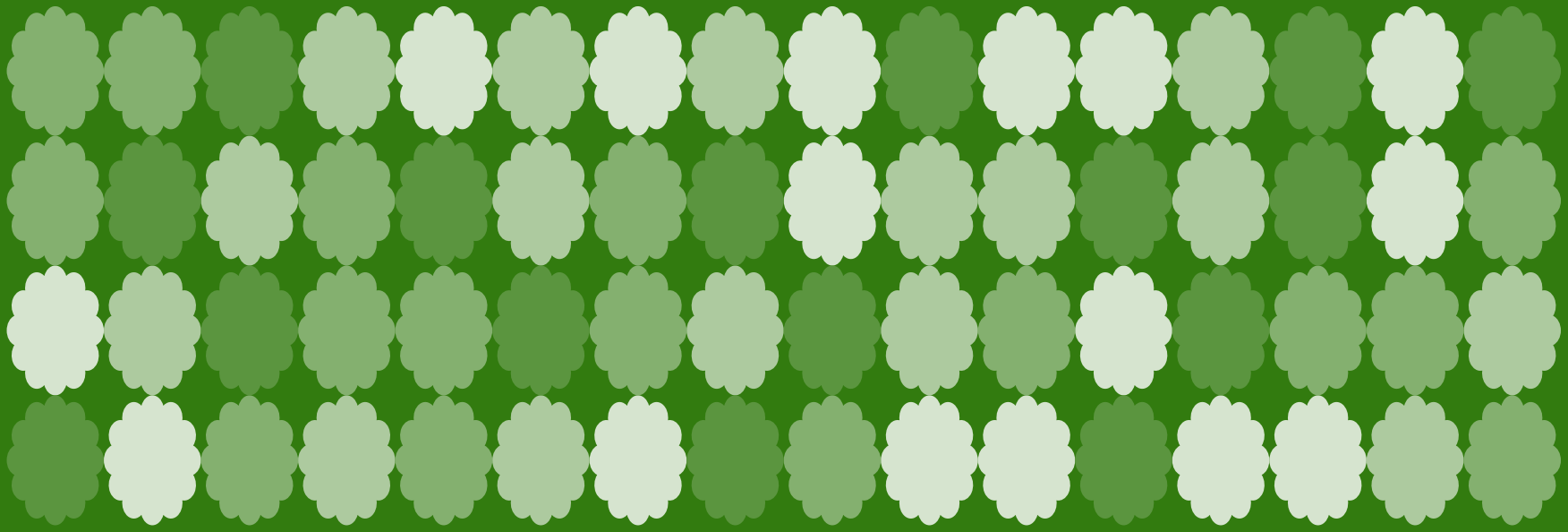
Life

GREATER MANCHESTER
DOING THINGS DIFFERENTLY FOR THE ENVIRONMENT

@GM GreenCity #GMGreenCity



The Ecological Network Tool

Using spatial modelling to identify priority areas for biodiversity and natural capital across the NWRBD

Click to edit Master title style

Map priorities for habitat creation/restoration to increase habitat connectivity and resilience across entire NWRBD.

Incorporate upland habitats and map priorities for ecosystem services and natural capital (e.g. flood risk mitigation).

Trial finer scale modelling techniques in selected case study sites to inform more localised interventions.

This Talk:

Project rationale and approach

DELIVERED: the Phase 4 Lowland Ecological Network.

DEVELOPING: upland mapping and case studies.

IMPACT: pipeline projects and potential Natural Capital benefits.

Rationale: Climate Change

Need to understand:

- Where **are** our existing habitat networks?
- Where **should** the networks be?

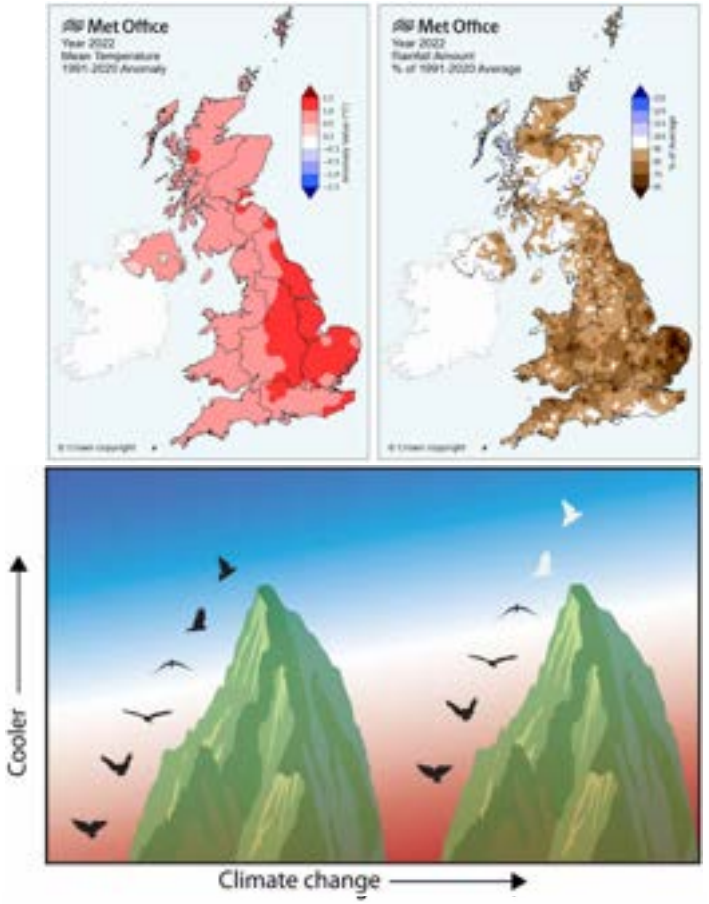
'where do species want to go?'

- Where **could** the networks be?

'where are conditions suitable?'

Aim to identify:

- Existing networks to protect and restore ***(Better)***
- Where networks can be enlarged or enhanced ***(Bigger)***
- Where additional stepping-stones are needed ***(Connected)***



Methodology: Connectivity

Condatis and Circuitscape:

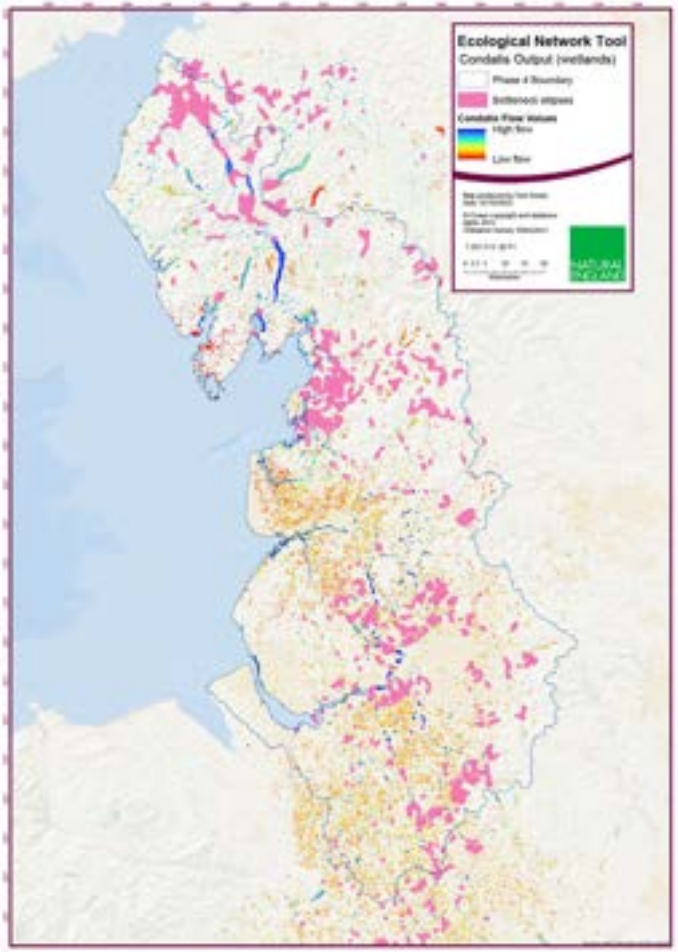
- Where **should** the networks be?

'where do species want to go?'

- Where additional stepping-stones are needed

(Connected)

- Lowland PHI bogs, fens, reedbeds, ponds, lakes.
- Broadleaf/mainly broadleaf woodlands



condatis

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Habitat Suitability Modelling

- Where **could** the networks be?

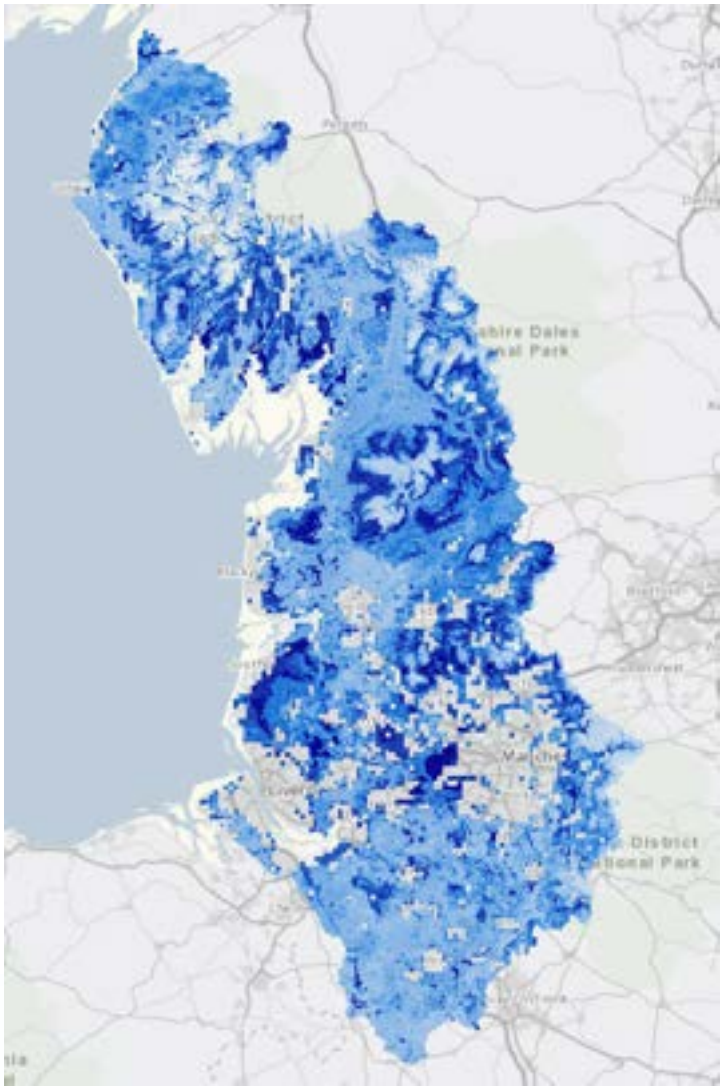
  'where are conditions suitable?'

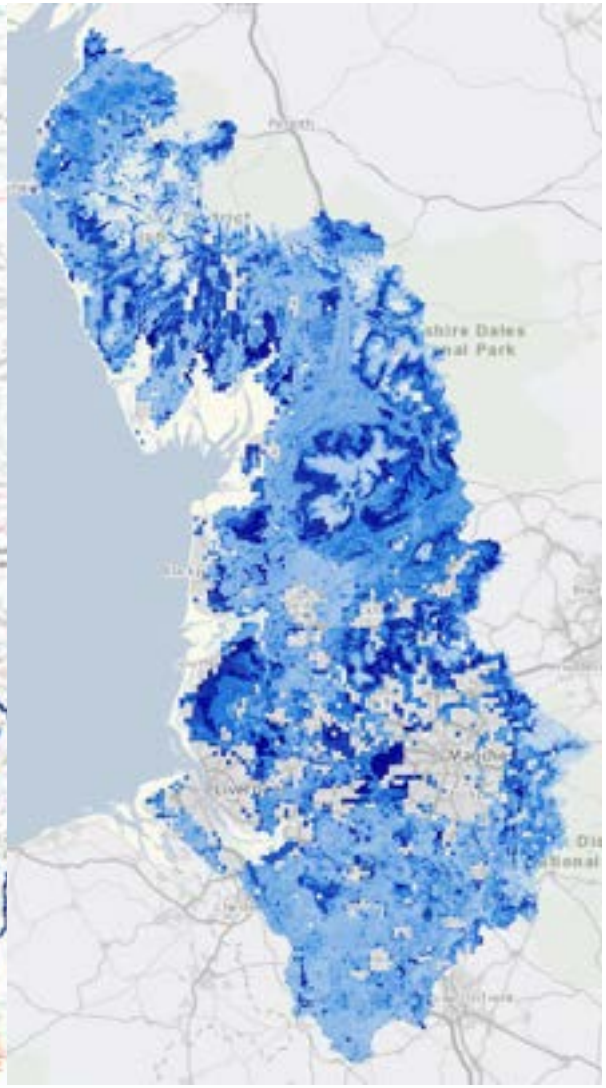
- Where networks can be enlarged or enhanced

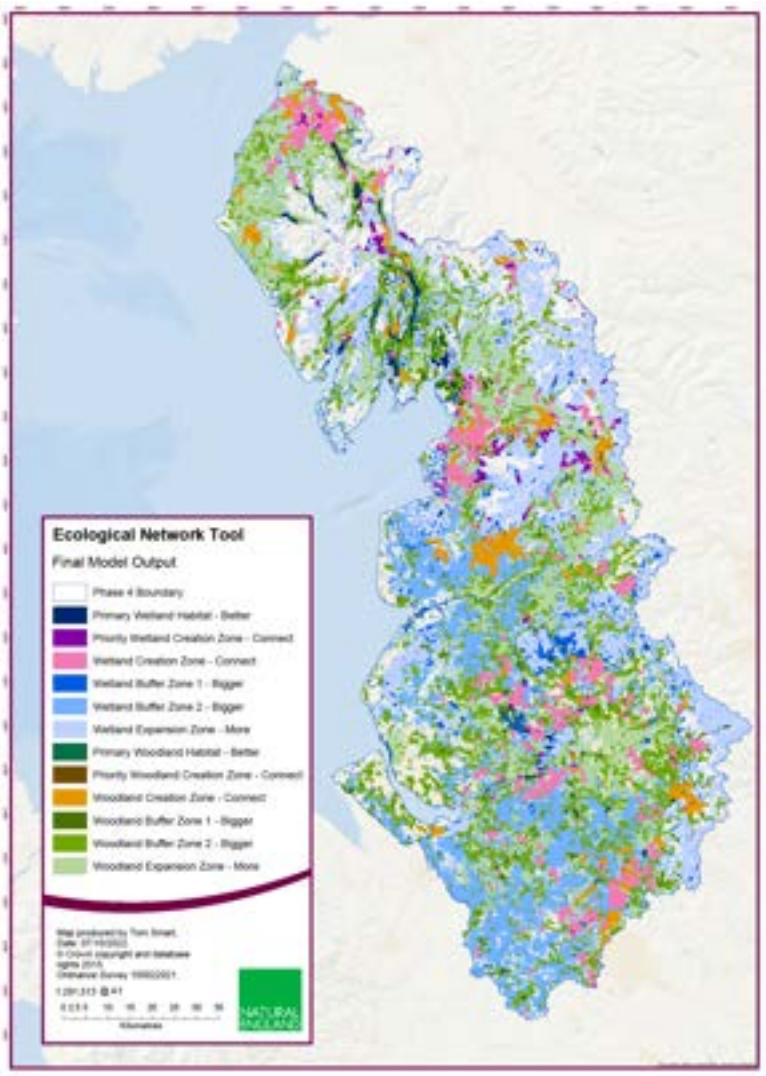
  (Bigger)

- Lowland PHI bogs, fens, reedbeds

- Soil C, P, N, wetness, elevation, slope.






Ecological Network Tool
Final Model Output
Phase 4 Boundary
Primary Wetland Habitat - Better
Priority Wetland Creation Zone - Connect
Wetland Creation Zone - Connect
Wetland Buffer Zone 1 - Bigger
Wetland Buffer Zone 2 - Bigger
Wetland Expansion Zone - More
Primary Woodland Habitat - Better
Priority Woodland Creation Zone - Connect
Woodland Creation Zone - Connect
Woodland Buffer Zone 1 - Bigger
Woodland Buffer Zone 2 - Bigger
Woodland Expansion Zone - More

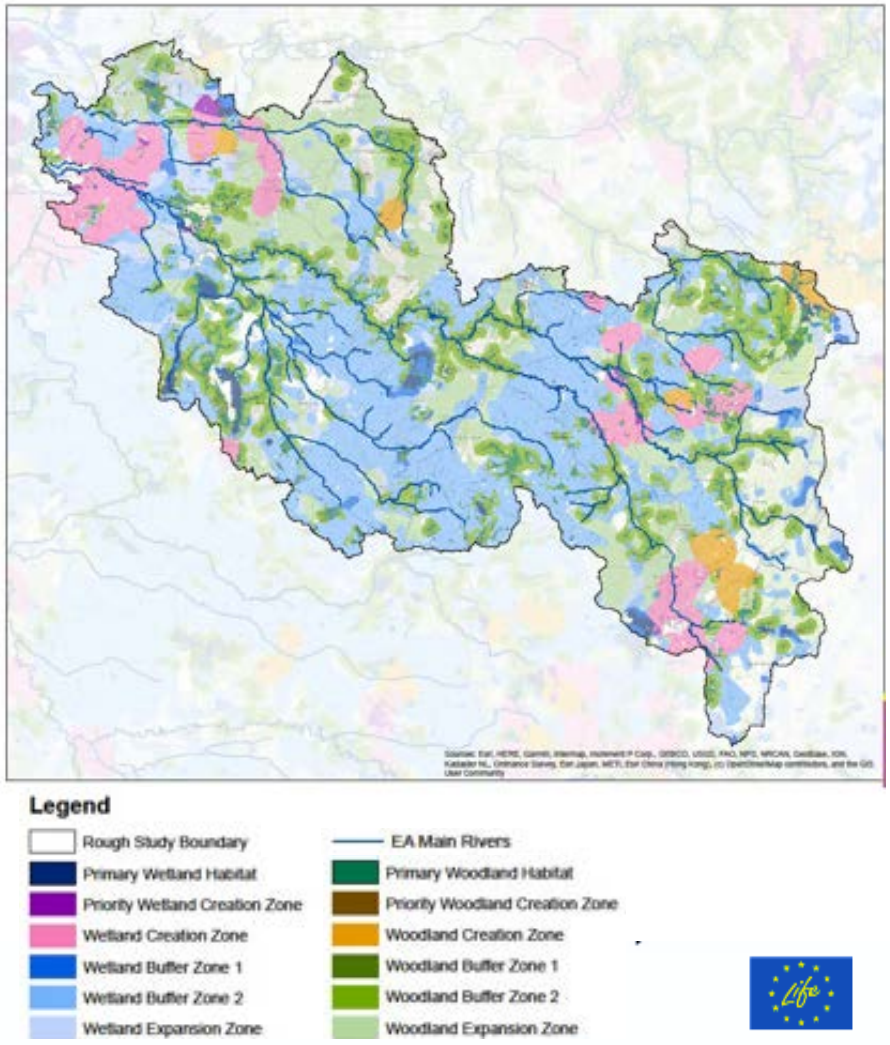
Lost Wetlands Focus Area

€470k Complementary funded project.

Used ENT as evidence to win funding.

Includes **€100k** BNG/Species Recovery Funding for mapping restoration opportunities.

Link with **C25** embedding WFD into LNRS development.



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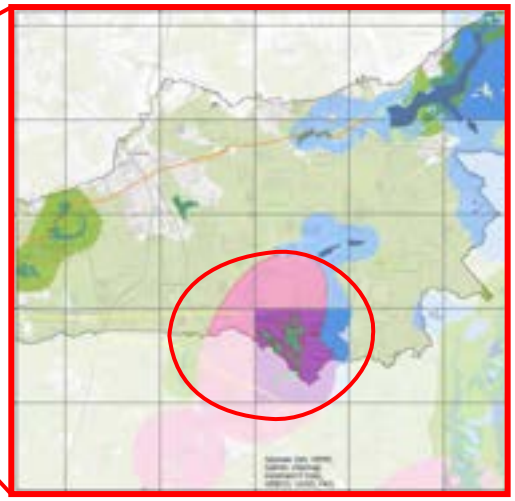
Using the Ecological Network Tool to identify NBS opportunities



1) Overlaying Tool with WFD data identifies candidate areas to look for project opportunities.

2) Further investigation reveals wetland bottleneck overlapping Fallowfield Brook and Highfield LNR.

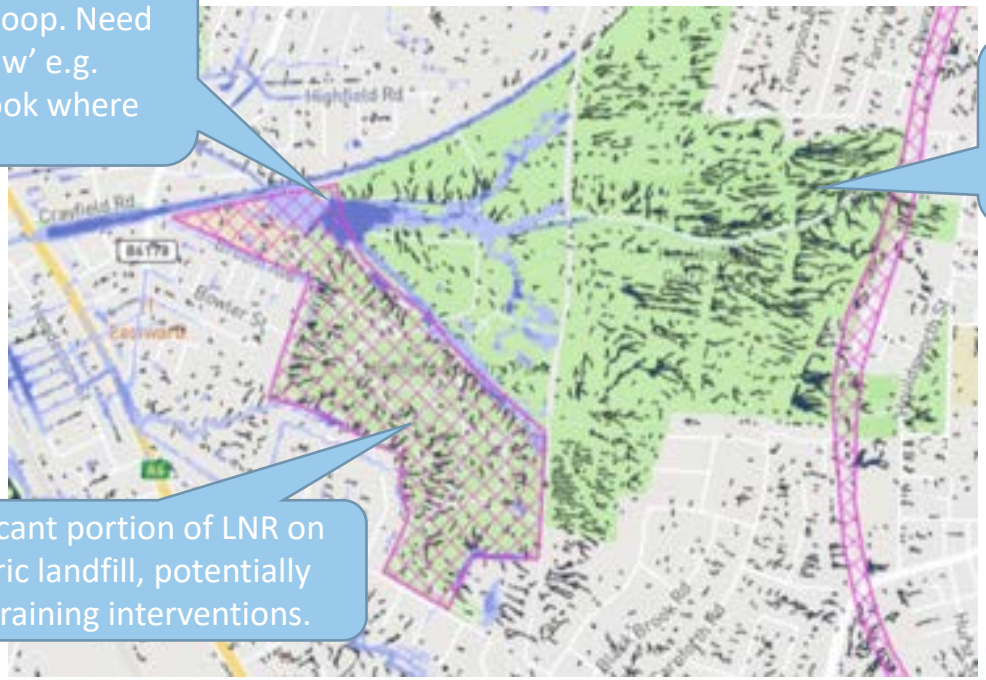
3) Tool identified opportunity at LNR-scale. Finer-scale local data/knowledge to identify specific opportunities.

Using the Ecological Network Tool to identify NBS opportunities

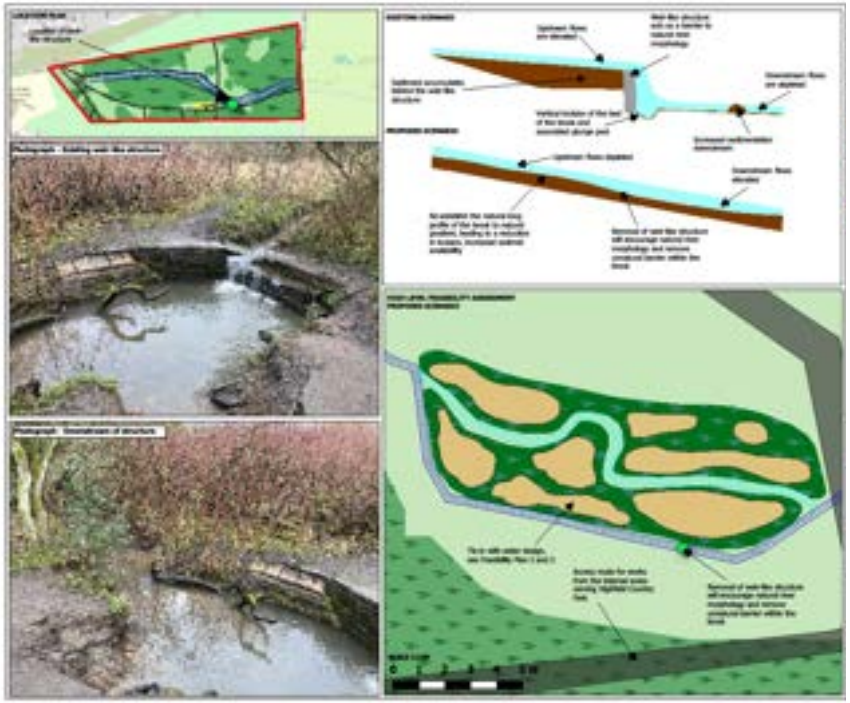
Flood risk highest around culvert and F'field loop. Need to 'Slow the Flow' e.g. reprofiling the Brook where possible.

Significant surface run-off apparent on adjacent golf course – requires mitigation e.g. reedbed installation.

Significant portion of LNR on historic landfill, potentially constraining interventions.



Using the Ecological Network Tool to identify NBS opportunities



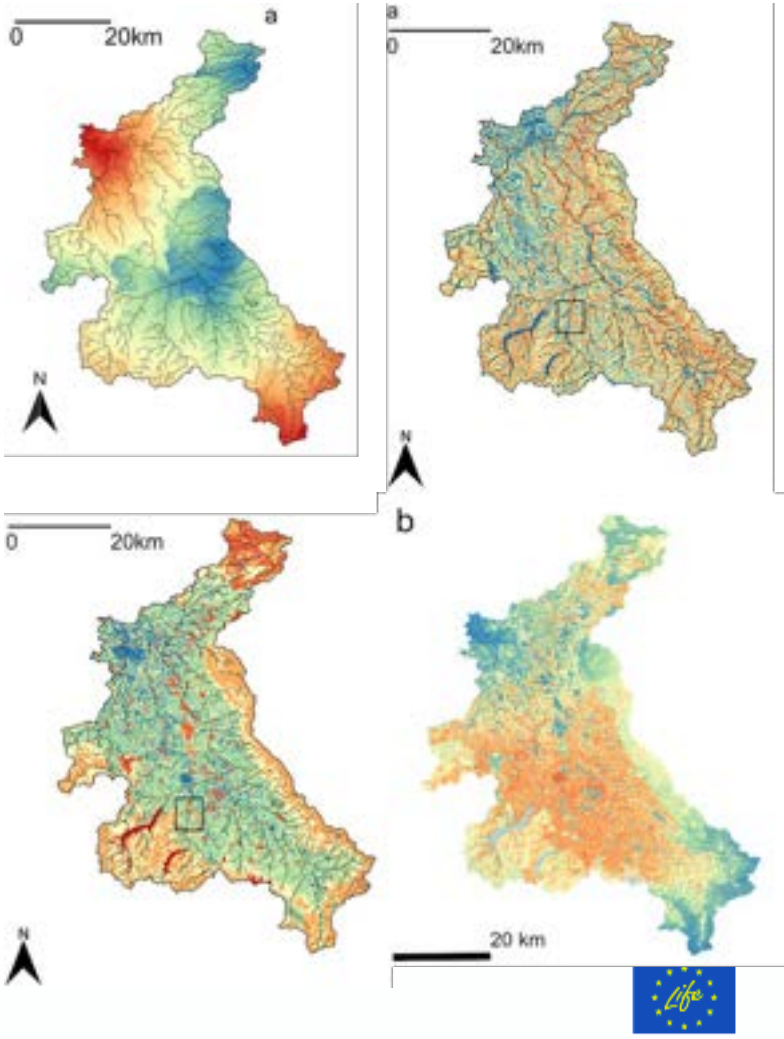
Prioritising NBS in the uplands: SCIMAP

- Durham University open source tool

- Incorporates topography, land cover, landscape connectivity

- Catchment scale

- Based on key rainfall events from last 30-40 years, with key points of impact being major conurbations in each catchment.



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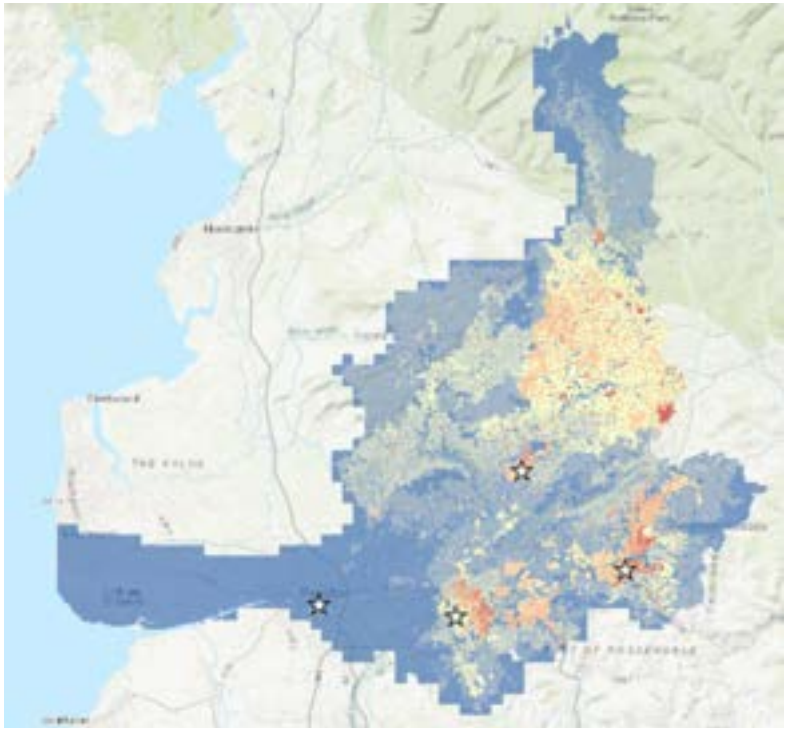


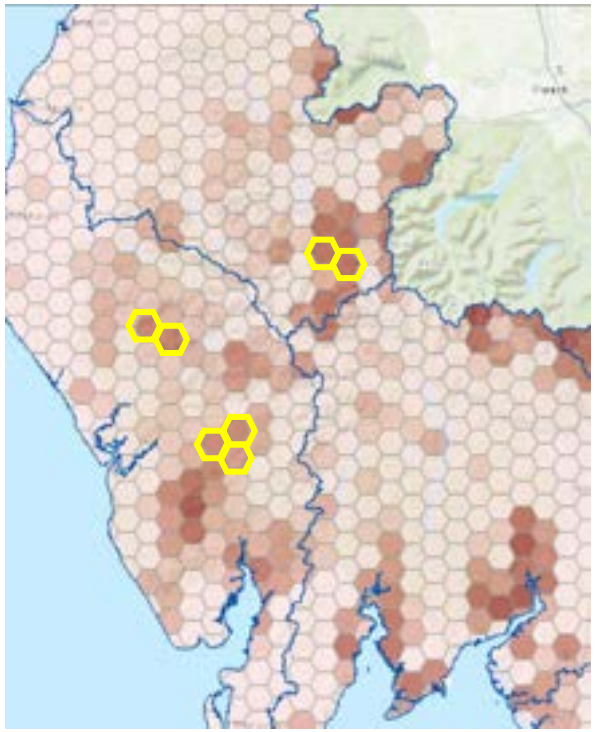
SCIMAP Priority Score

- 0 - 0.031372549
- 0.031372549 - 0.082352941
- 0.082352941 - 0.145098039
- 0.145098039 - 0.215686274
- 0.215686274 - 0.325490196
- 0.325490196 - 0.521568627
- 0.521568627 - 1

SCIMAP Priority Score

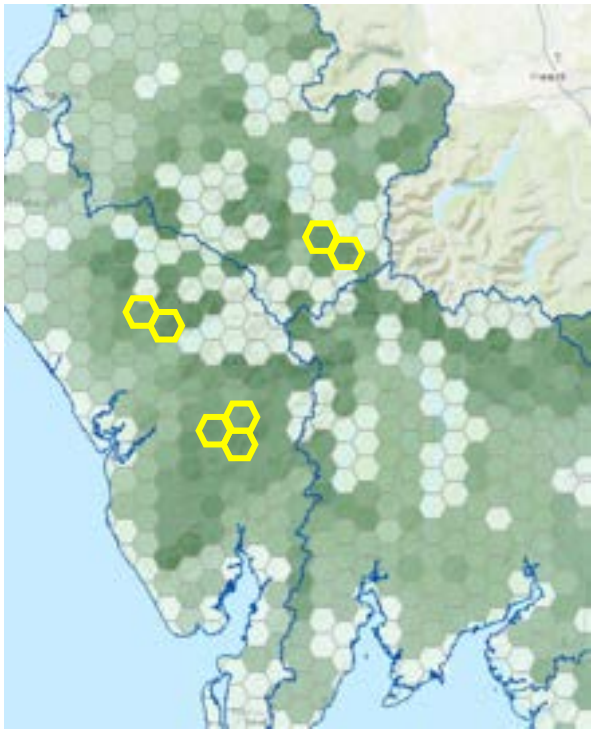
- 0 - 0.02745098
- 0.02745098 - 0.058823529
- 0.058823529 - 0.090196078
- 0.090196078 - 0.129411765
- 0.129411765 - 0.188235294
- 0.188235294 - 0.388235294
- 0.388235294 - 1

SCIMAP vs Peat/Soil Carbon layer



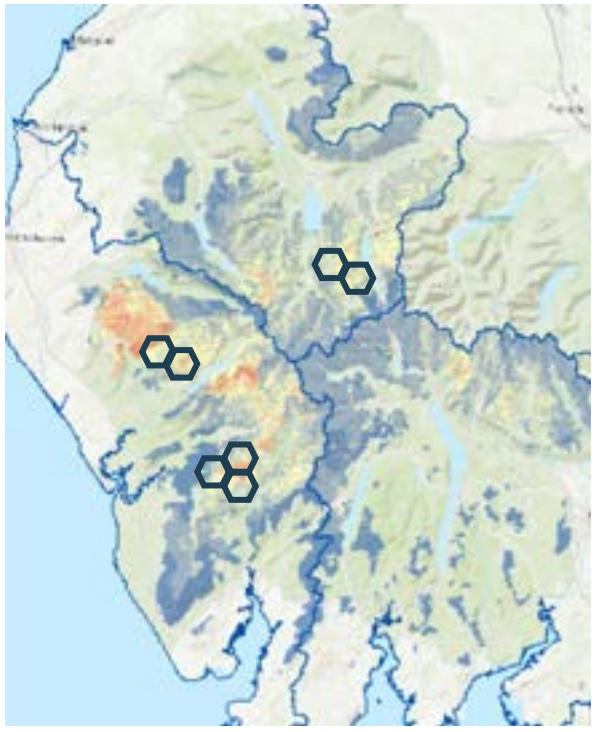
Deep Peat

- 0.000000 - 182535.414966
- 182535.414967 - 585332.128122
- 585332.128123 - 1154755.033470
- 1154755.033471 - 1923821.349280
- 1923821.349281 - 2899420.841570
- 2899420.841571 - 3985708.332890
- 3985708.332891 - 4996305.065190



Soil Carbon

- 0.000000
- 0.000001 - 58.332391
- 58.332392 - 68.851357
- 68.851358 - 74.072331
- 74.072332 - 78.928867
- 78.928868 - 84.421304
- 84.421305 - 96.541031



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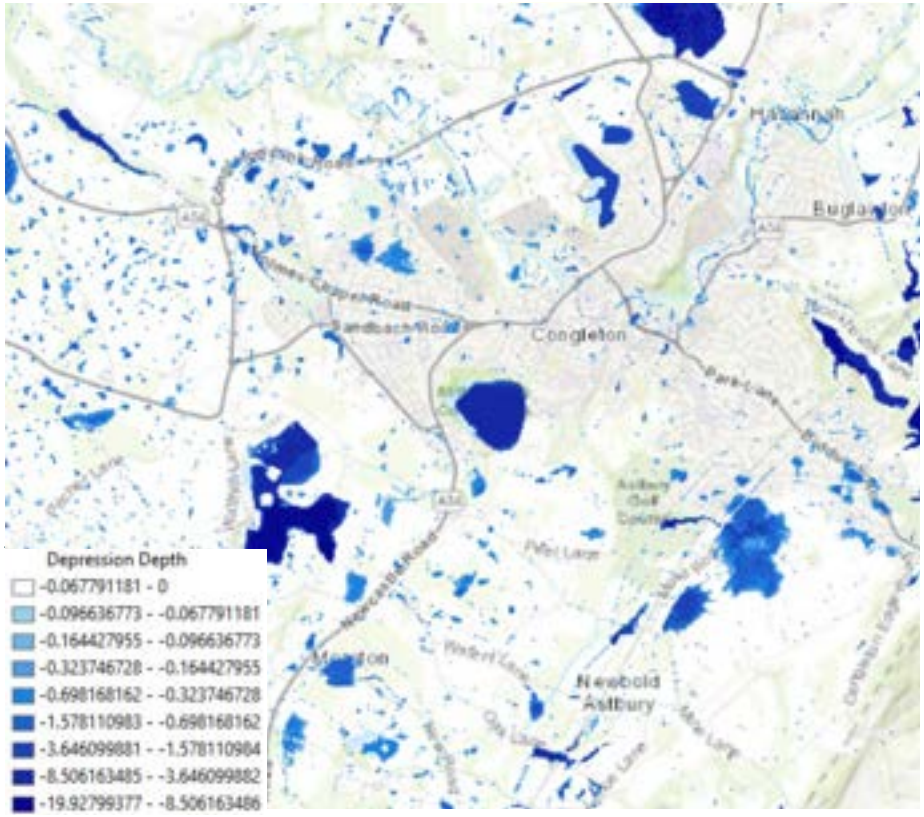
- 0.188235294 - 0.388235294
- 0.388235294 - 1

Case Study 1: ‘Pondscapes’ (Congleton)

- Site selected based on wetland creaton zones in ENT.
- Uses 1m Lidar data to identify depressions for ‘natural pooling’.
- Identify highly localised opportunities for pond creation in marginal fields subject to periodic flooding.
- Very simple method to quickly inform ELMS/BNG opportunities.



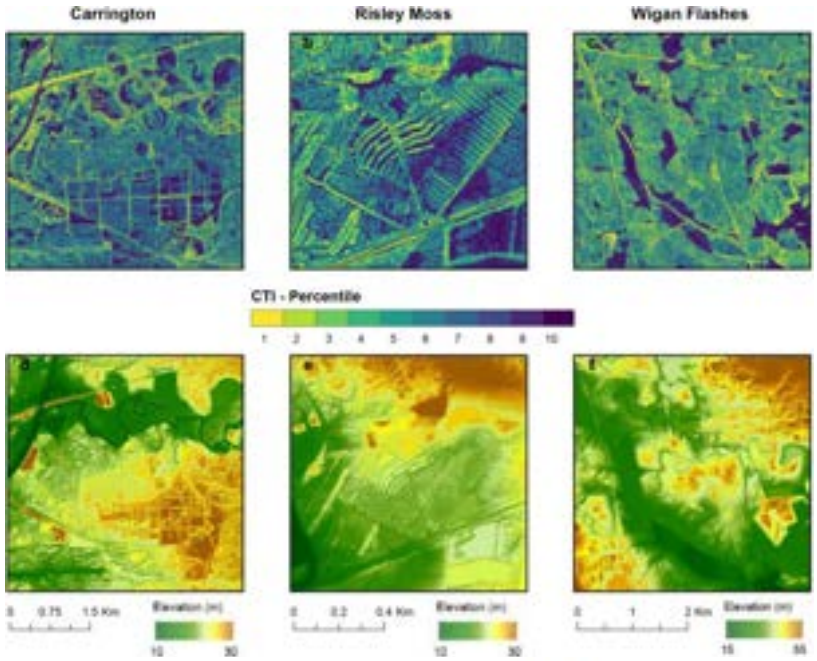
Case Study 2: Compound Topographic Wetness Index (Wyre Catchment)

- Approach developed by MMU academics and NE specialists.

- LiDAR 1m resolution to calculate ‘flow accumulation’

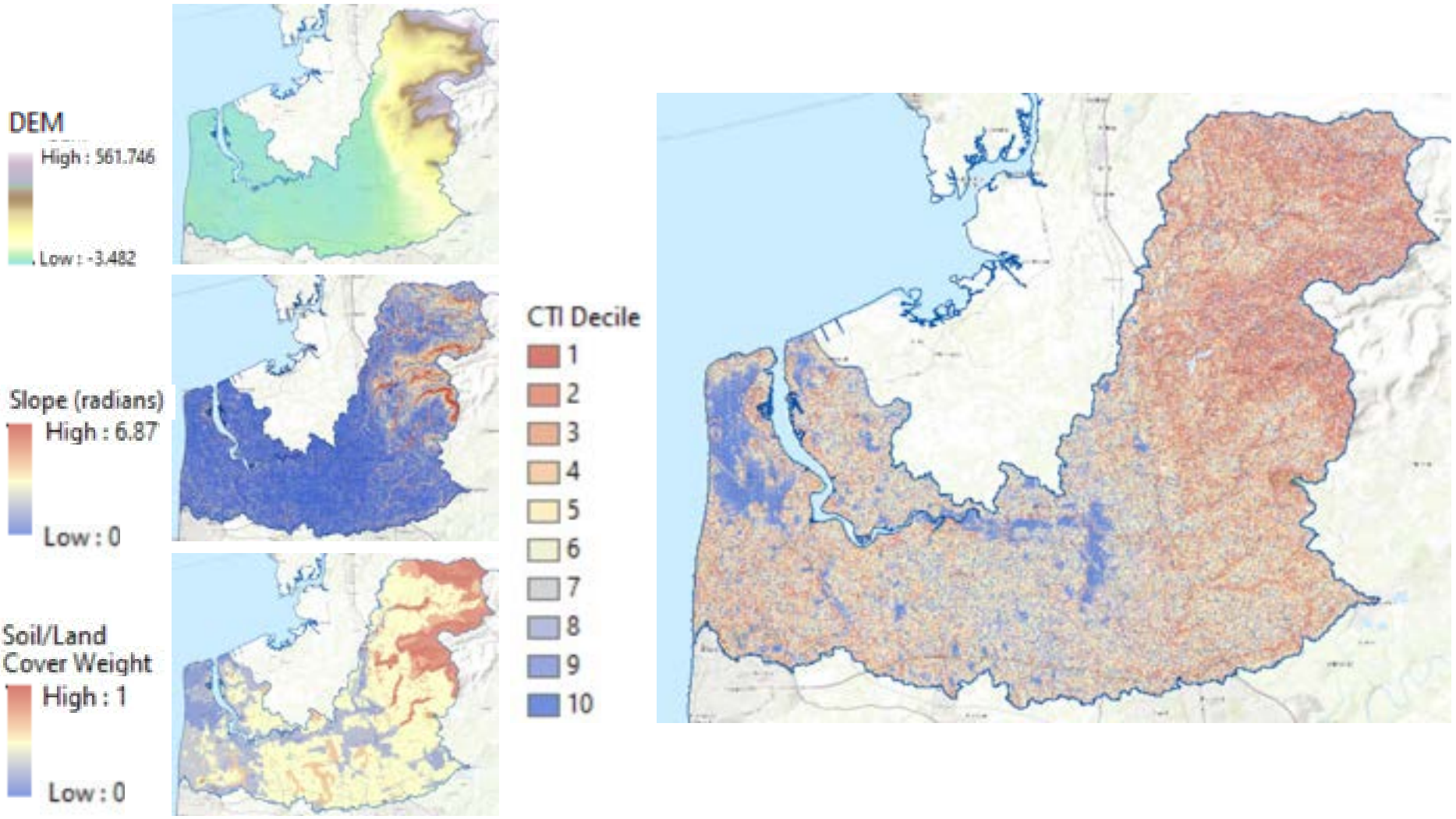
- Weighted by soil and land cover permeability.

- Highlights areas where land likely to be able to hold water (e.g. wetland restoration opportunity)



High-resolution wetness index mapping: A useful tool for regional scale wetland management

Thomas P. Higginbottom, C.D. Field, A.E. Rosenburgh, A. Wright, E. Symeonakis, S.J.M. Caporn


DEM
High : 561.746
Low : -3.482
Slope (radians)
High : 6.87
Low : 0
Soil/Land Cover Weight
High : 1
Low : 0
CTI Decile
1
2
3
4
5
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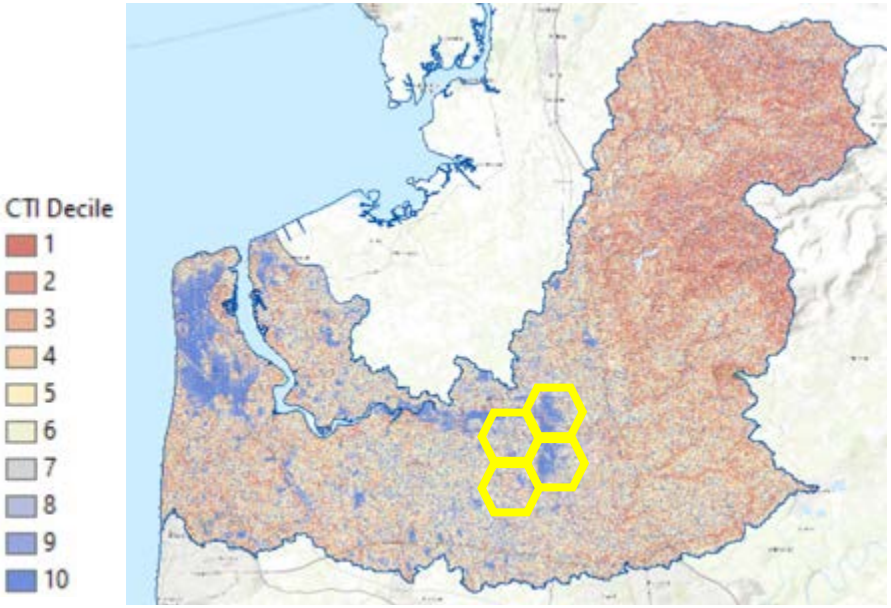
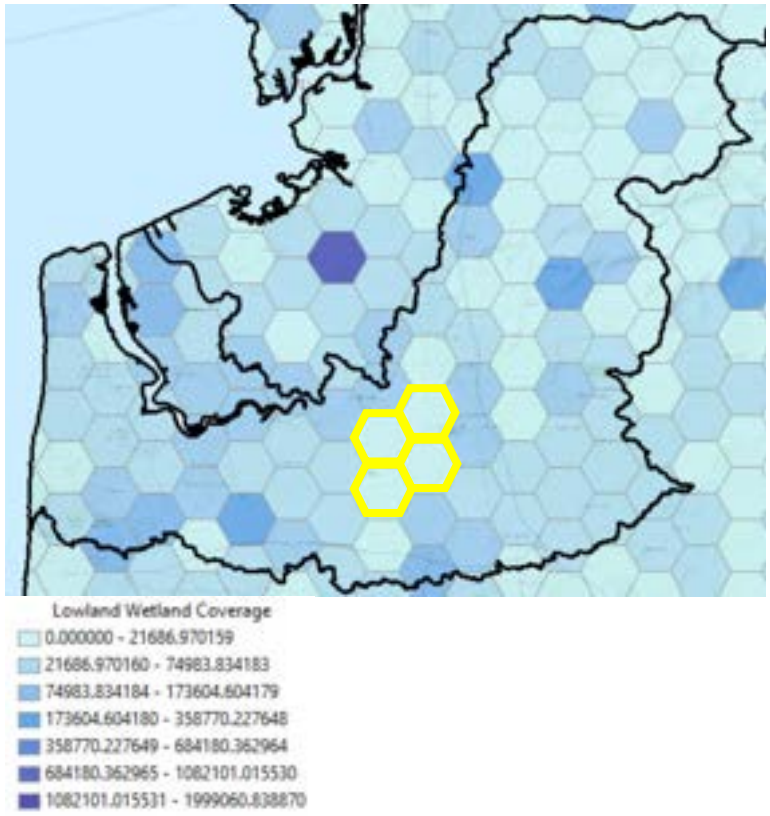
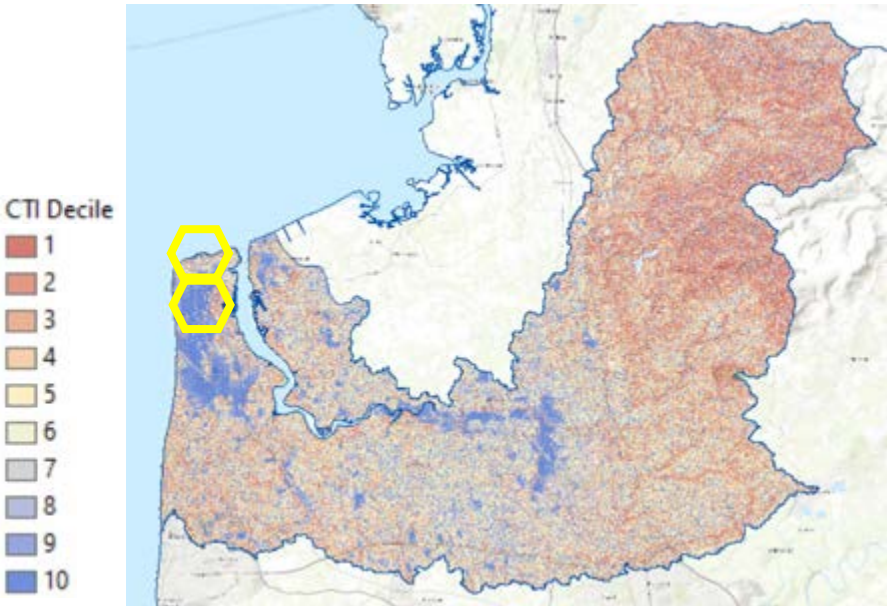
10

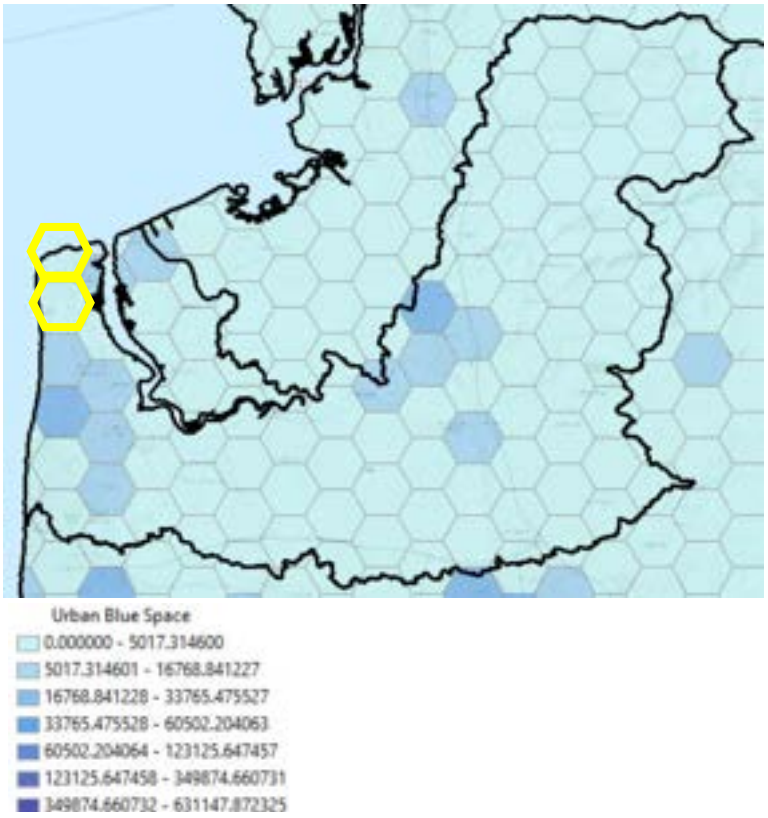
Wyre CTI vs Wetland Quantity





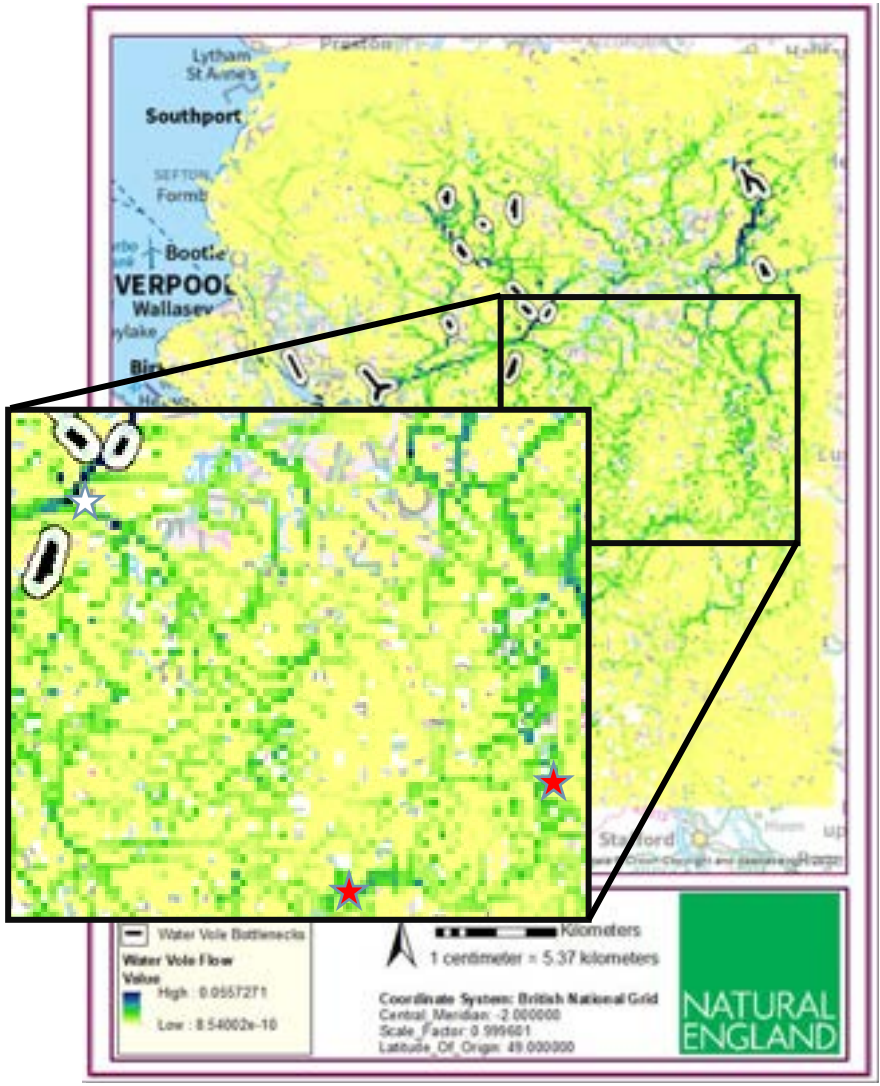
Wyre CTI vs Urban/Peri-urban Blue Infrastructure





Case Study 3: Condatis for Water Voles (Bollin)

- Applying Condatis at fine spatial and taxonomic resolution.
- Preliminary work through Lost Wetlands project (500m resolution, Cheshire/GM).
- Limited occurrence data: using broad scale Condatis modelling to identify likely sources for Bollin populations.
- Inform management plans and collaborative complementary projects with partners.



In Summary:

Lowland Ecological Network Tool maps priorities for lowland wetland and woodland creation to maximise connectivity and network resilience.

Used in combination with additional datasets it shows where investment in NC can provide ES benefits for both people and nature.

Inclusion of upland habitats with a focus on upland bogs to ‘slow the flow’ and reduce flood risk for communities downstream.

Case studies under development showcasing different tools in different geographies, informing more specific interventions at local scale.

Irwell Natural Capital Account and Ecosystem Services Opportunity Mapping Tool

Natural Capital Event 25th April 2023

Natural Course objectives

Integrated Water Management

Improved water quality

Reduced flood risk

Enhanced biodiversity

Natural Capital & Catchment Based Approach

Catchment Based Approach
Partnerships for Action

Key outputs

- ESS Opportunity Mapping tool live on MappingGM https://mappinggm.org.uk/gmodin/
- Final report and Executive Summary published and online at http://naturalcourse.co.uk/
- Master Datasets (Appendix A), Mapping Tool User Guide (Appendix F), Opportunity Assessment Methods and Mapping Protocols (Appendix E)

- Extending the ESS Opportunity Tool
- Further project support to embed the outputs from the study
- Natural Capital Investment Plan

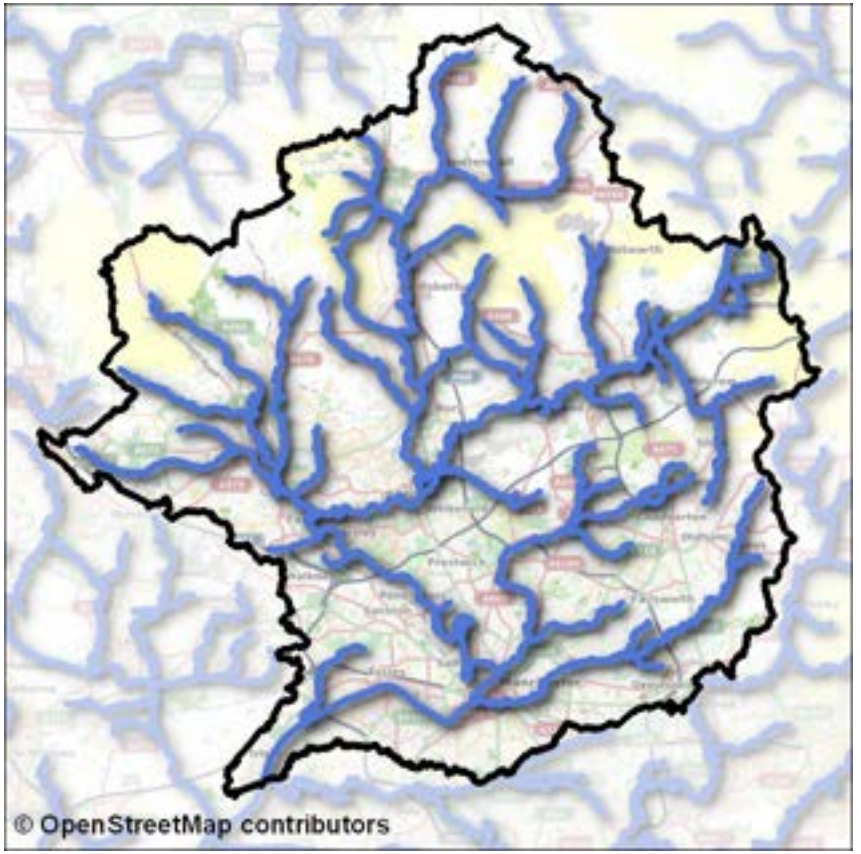
Study area

The WFD Surface Water Operational Catchment Cycle 2 was used as the overall project boundary for the Irwell Management Catchment.

Environment Agency 2016 data.

The principal waterbodies are the Irwell, Roch, Croal, Irk and Medlock along with their tributaries.

The study focussed on the rivers and their floodplains. This formed the “study area” for the natural capital account and the ESS opportunity assessment.



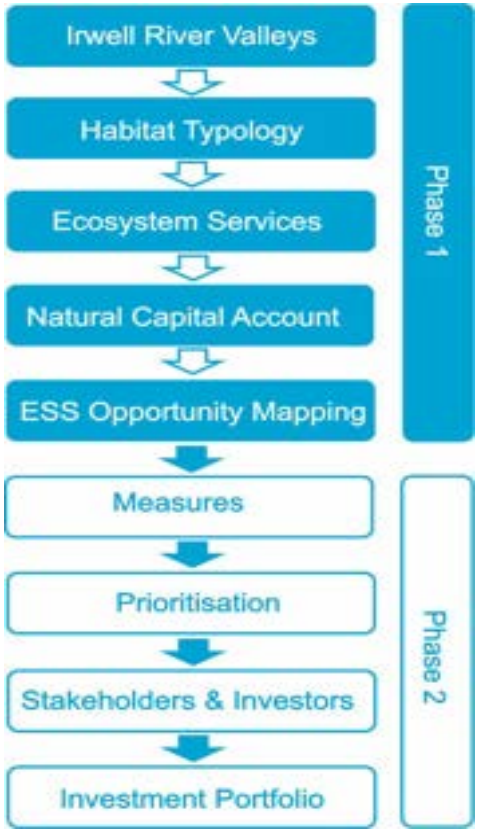
The method

The study went through a number of steps which will eventually lead to a portfolio of projects that enhance the natural capital of the Irwell Management Catchment.

This study focussed on phase 1, and provided a thorough valuation of natural capital, alongside detailed maps of ESS opportunity.

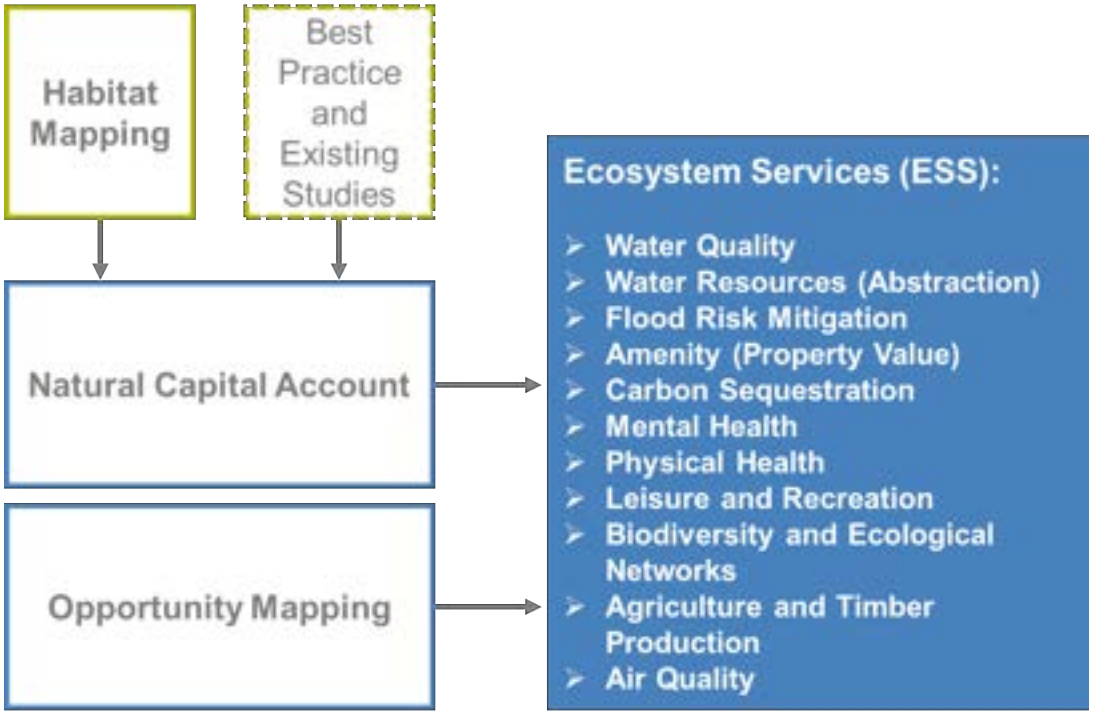
This also provided a commentary on the measures, priorities and partnerships needed to develop the investment portfolio.

The method developed used open data and national datasets, as far as possible to enable the process to be repeated across similar urban catchments.



Habitat mapping and scoping of ESS

- This diagram shows Phase 1 of the project was completed.
- The habitat mapping, best practice and existing studies all feed into the Natural Capital Account and Opportunity Mapping.
- The ESS included in the scope of the project are shown on the right hand side.

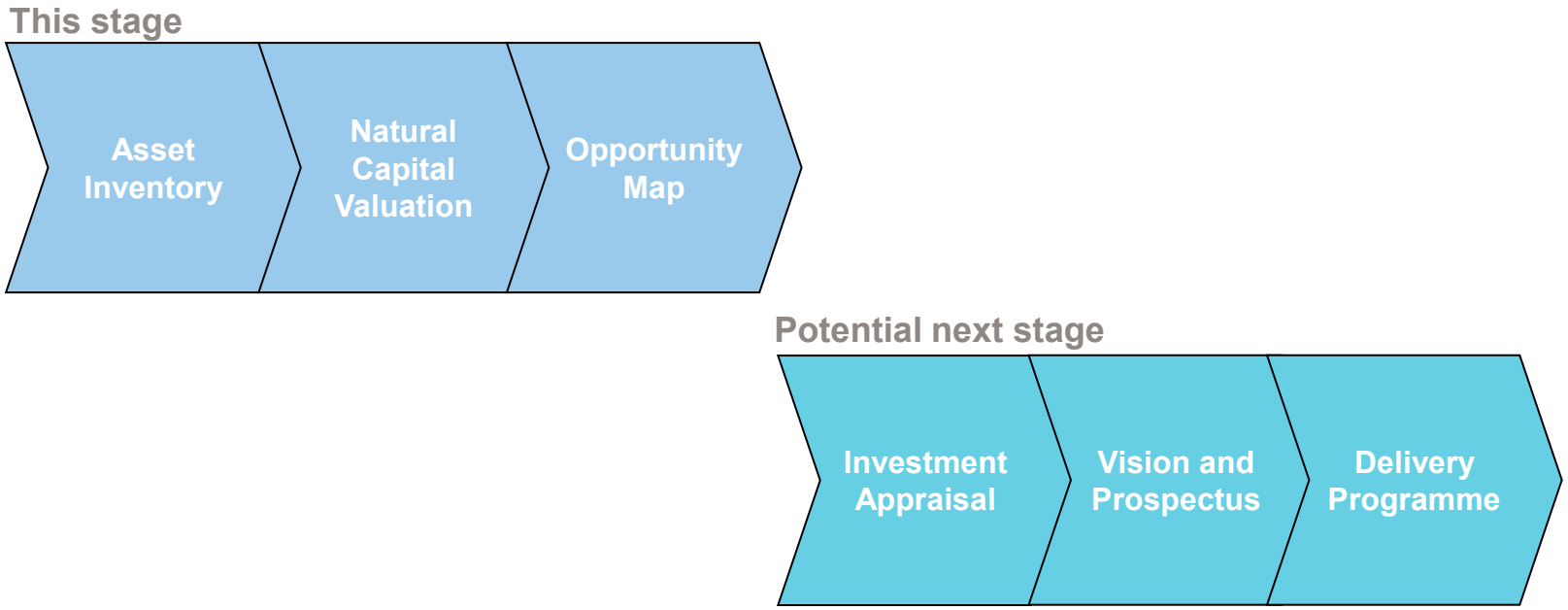


Ecosystem services excluded from valuation

Service	Reason(s) for exclusion
Biodiversity	Lack of scientific and economic agreement of the role biodiversity as a service plays
Pollination	Value of pollination likely to be capturing in agriculture. Generally poor understanding of decline in pollinator populations on agricultural production
Air quality	Impact of open and green spaces on air pollution currently not well understood Upcoming Defra work to be published for UK
Noise	Complex modelling requires to estimate effect of vegetation on noise pollution abatement Upcoming Defra work to be published for UK
Temperature regulation	A number of previous studies at the city-level – not useful for mapping Tools available for Manchester don't allow for simple extraction. Unclear what level models should be applied

Informing Project Objectives

This project can inform objectives based on current provision of benefits from natural capital and location of opportunities



Recreation and health benefits

Recreation and health benefits are the largest sources of value of natural capital in the Irwell Management Catchment, followed by water abstraction services

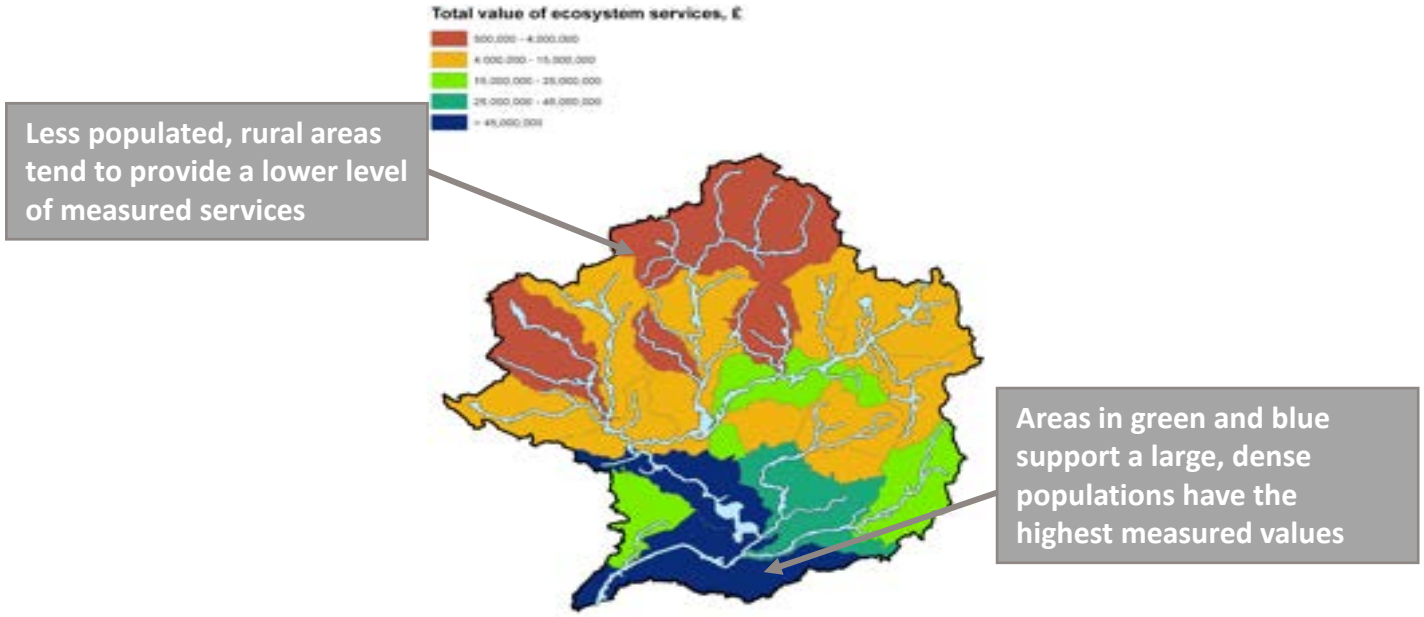
The magnitude of benefits from public green space highlights their role as critical infrastructure

Service	Value (£m)	%
Assets		
Recreation	190	41
Physical health	98	21
Amenity	80	17
Mental health	59	13
Water abstraction	23	5
Water quality	14	3
Carbon sequestration	1	<1
Agriculture	<1	<1
Timber Production	<1	<1
Gross Value	465	100
Liabilities		
Flood Risk	(47)	
Net Value	418	

Expected flood damages enter as liabilities to illustrate gains from reducing flood risk

Accessing value of services at different scales

Users are able to access value of services from natural capital at scales relevant for decision-making



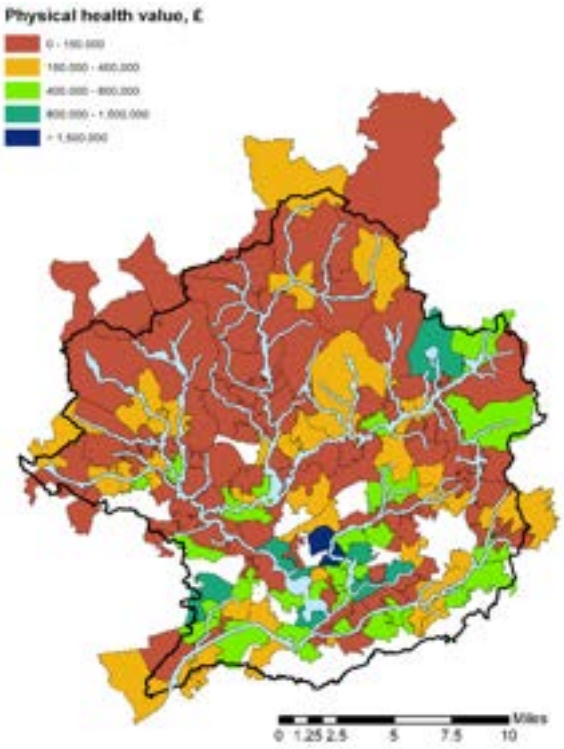
Physical health benefits

Physical health benefits from green spaces are largest where green areas support large urban populations

Active visits in each Middle Super Output Area (MSOA) by those with an active lifestyle, using White et al. (2016) study's finding and the data reported in the Monitoring of Engagement with the Natural Environment (MENE) survey.

Overall avoided economic health costs are calculated by aggregating avoided costs per visit. Indirect and direct costs per active person are used to estimate costs avoided per visit.

	Value
Estimated number of 'active' visits per year	27 million
Cost savings	£98m/yr
Per person cost saving (persons of all ages)	£66/head/yr



Recreational benefits

Recreation benefits represent the largest source of value from natural capital and are derived from the ORVal tool

- Recreational visits and values are based on what we might expect for a typical greenspace with given features in the river corridor, accounting for the availability of other greenspace and the characteristics of the local population.
- These values reflect the welfare revealed by how far people are willing to travel to different greenspaces.
- The recreational values reported here will not take account of aspects such as uniqueness of sites and particular types of recreational activities.

	Value
Estimated number of visits to recreation sites per year	55 million
Total value of recreation benefits	£27m/yr
Per person benefits in waterbody	£127/head/yr

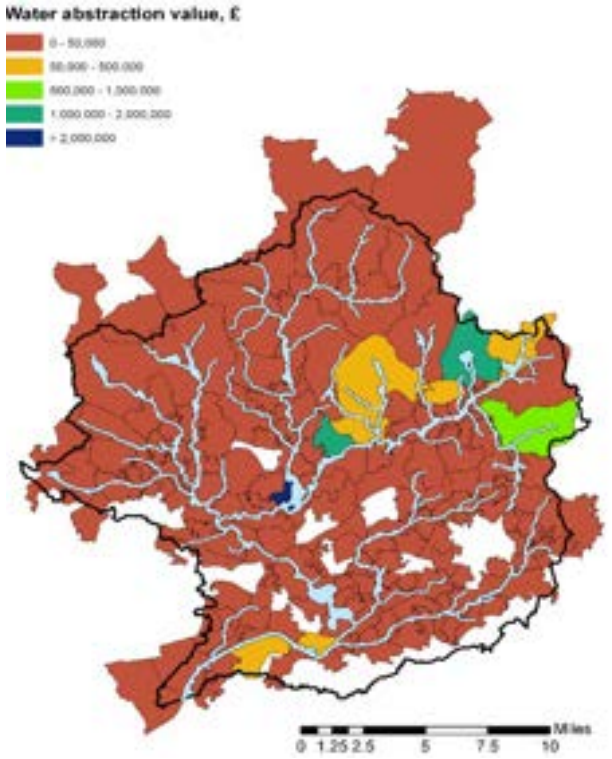
Source: Vivid Economics using ORVal (2016) tool based on data from MENE (Monitor of Engagement with Natural Environment) Survey

Water benefits

The value of water use is estimated separately according to end use and by location of abstraction

Energy and industrial users are the most significant abstractors in the waterbody

Water use	Volume abstracted in 2016, million m^3	Unit resource rent, £/m^3	Annual value, £m
Industrial, Commercial and Public Services	15	0.1	2
Water Supply	107	0.15	14
Agriculture	<1	1.25	<1
Energy	74	0.1	7
Total	**196**		**23**

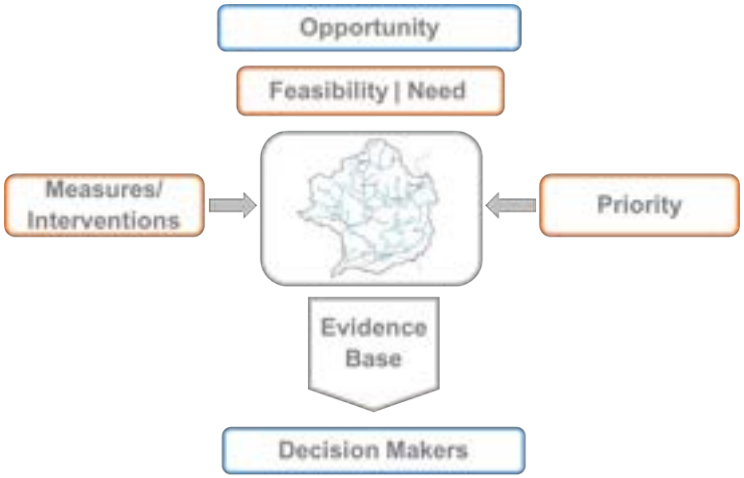


ESS Opportunity Mapping Tool

- An Ecosystem Service (ESS) opportunity arises on land which, given its physical, social, economic, geographical and cultural characteristics, offers potential to intervene and improve ESS functioning and thus uplift Natural Capital.
- ESS opportunity arises where there is a combination of feasibility and need.

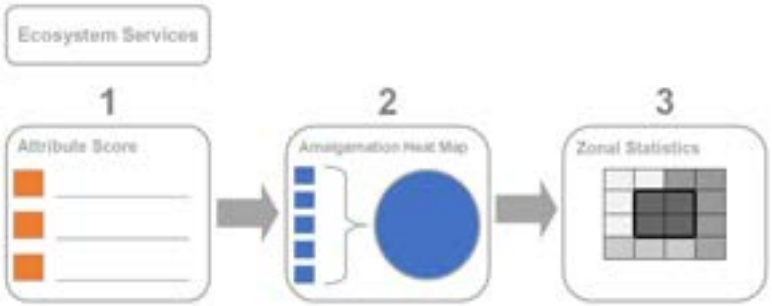
  - Feasibility: some land uses are unlikely to be capable of significant change to improve ecological functioning e.g. road surfaces, cemeteries, private residences. These are ruled out of opportunity assessment.

  - Need: some land uses are already in optimal ecological condition for the ESS in question e.g. woodlands cannot be bettered in respect of ESS such as carbon sequestration.



ESS Opportunity Mapping Tool

- Over 30 individual aspects of the environment have been assessed using spatial analysis to identify ESS opportunities within the study area.
- Geo spatial analysis, informed by current best practice has identified multiple opportunities across every district and waterbody within the study area.
- The opportunity assessment for each ESS is based on 'Attributes' which analyse different aspects of each service.
- For example, water quality ESS is made up of an assessment of attributes including: land connectivity, hydrological connectivity, slope, soil characteristics, land use and consented discharge locations. The combination of the scores from the ESS attributes provides the overall score for the service.



Water quality example: Attribute

This map shows consented discharge locations.

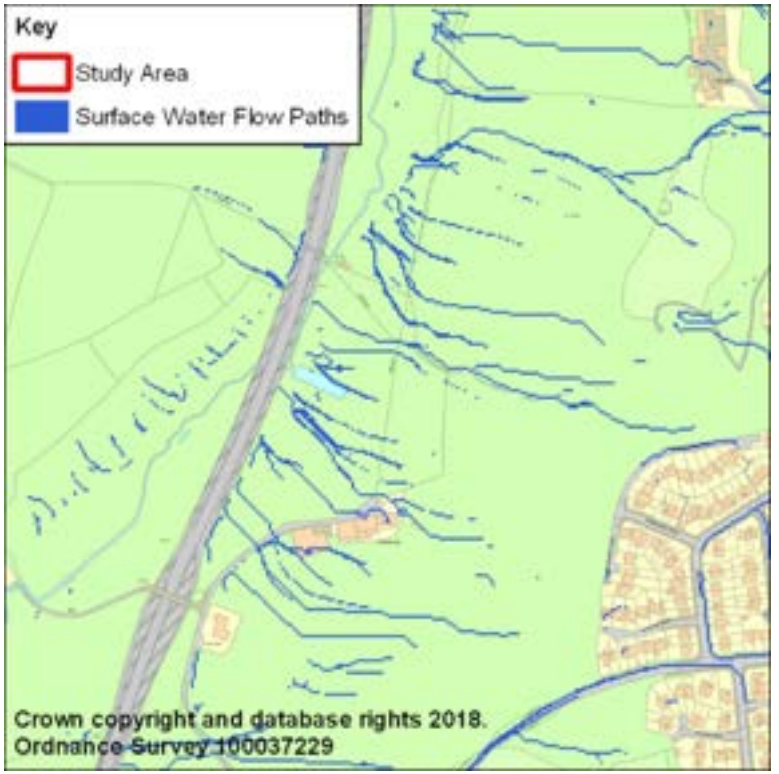
Land parcels with a consented discharge point receive a score of 1 and there may be opportunity to intervene to remodel the discharge point or install filter beds of natural vegetation.

Water quality example: Attribute

This map shows flowpaths.

Land parcels with surface water flowpaths receive a score of 1.

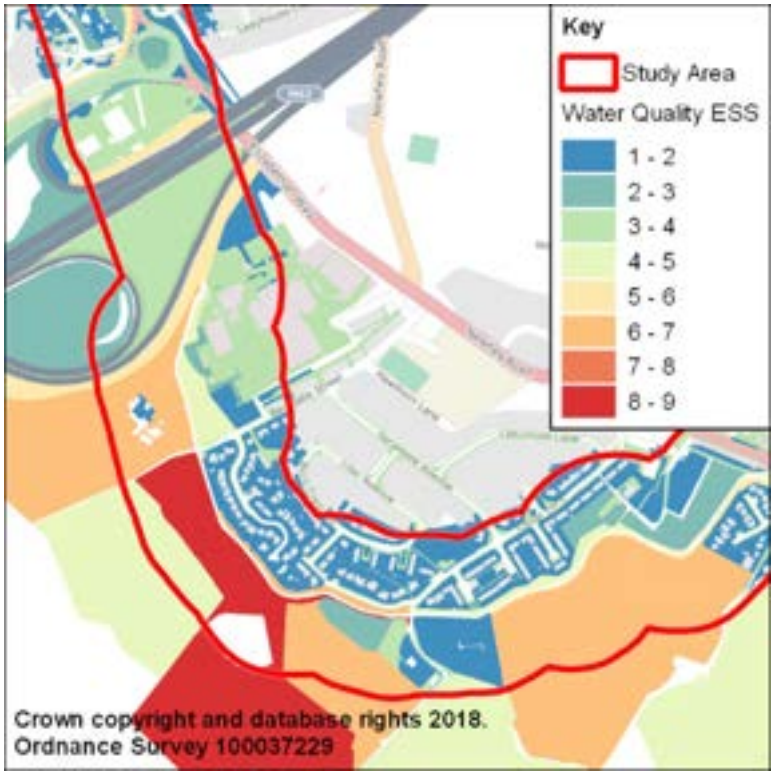
Flowpaths and areas where water might ‘pool’ offer opportunities for wetland creation and establishment of wet woodland and reedbeds to capture and filter sediment and pollution.



Water quality example: Heat map

- The Water Quality Opportunity Heat Map combines all the attribute scores for Water Quality, which includes consented discharge locations and flowpaths.

- Land parcels with the highest opportunities for water quality are shown in red and those with less opportunities are shown in blue.

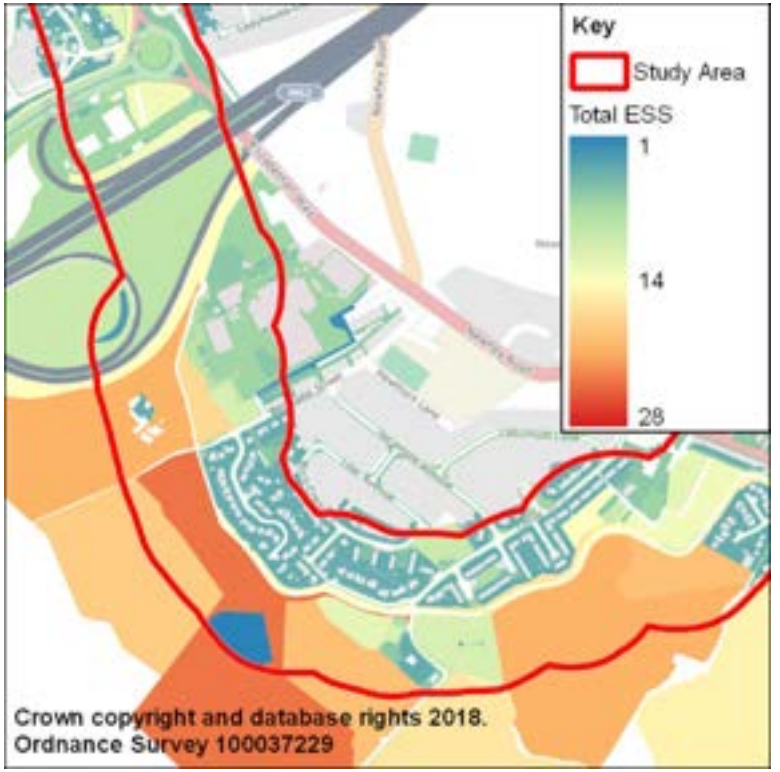


ESS Assessment

A composite heat map for all ESS in the study area is generated, including:

- Water quality;
- Flood risk mitigation;
- Recreation and leisure (including physical and mental health);
- Amenity;
- Carbon sequestration;
- Biodiversity and ecological networks; and
- Air quality.

Note: A program for keeping the Mapping Tool updated to take account of MasterMap updates and development of projects is currently being discussed.



Value of ESS

Value of ecosystem services and number of opportunities compared to create categories of prioritisation

Catchment Name	Population	Total Natural Capital	Per Head	Recreation	Physical Health	Mental Health	Amenity	Carbon Seq.	Water Quality	Flood Risk Mitigation	Water Abstraction	Agriculture (Food Production)	Biodiversity and Ecological Networks	Air Quality
Astley Brook (Irwell)	30,000	£2.9m	£97											
Beal	37,000	£7.6m	£205											
Bradshaw Brook	34,000	£7.1m	£209											
Croal (including Blackshaw Brook)	55,000	£10m	£182											
Eagley Brook	24,000	£3.6m	£150											
Folly Brook and Salteye Brook	62,000	£21m	£339											
Irk (Source to Wince Brook)	68,000	£14m	£206											
Irk (Wince to Irwell)	120,000	£45m	£375											

£	*Grey highlighted cells indicate that both the natural capital value and the ESS Opportunity Ranking is below average.*
£	*Blue highlighted cells indicate that the natural capital value is above average but the ESS Opportunity Ranking is below average.*
£	*Yellow highlighted cells indicate that the natural capital value is below average but the ESS Opportunity Ranking is above average.*
£	*Orange highlighted cells indicate that both the natural capital value and ESS Opportunity Ranking is above average.*

Setting high level objectives and strategy

Categorisation of current benefits and opportunities can help set high-level objectives and strategy

Priority 1 – Opportunities are high in urban and urban-rural fringe communities typically with deprivation concerns and flood risk issues (yellow) - equity

Priority 2 – There are many opportunities to improve critical urban infrastructure in densely populated areas (orange)

Example 1: Local Plan Policy and Allocations

Planners could use the work at two levels:

1. Inform high level strategic vision.

- Understand the distribution of current benefits to inform future spending plans and equity priorities.
- Example: Per person natural capital benefits between waterbodies in IMC range from £68 to £560.
- Prioritise areas based on current provision of natural capital and opportunities for development.

2. Categorise specific sites for future development.

- Identify opportunity sites in line with priorities around equity.

Example 2: Informing catchment partnership projects

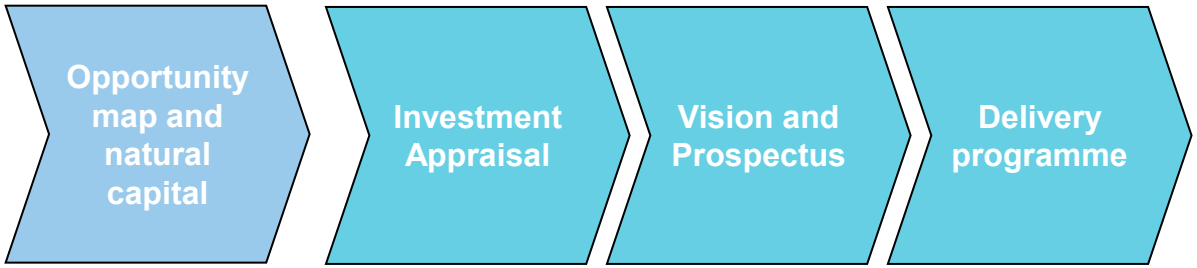
The Irwell Catchment Partnership includes a range of stakeholders including Irwell Rivers Trust, Lancashire Wildlife Trust, United Utilities, Environment Agency, and local authorities.

Many of stakeholders act as:

- Owners of key assets;
- Managers of assets; and
- Beneficiaries of services.

The natural capital assessment can provide a focal point to structure discussions about funding arrangements and management strategies. It can also be used to structure potential partnerships in the IMC e.g. engaging partners in healthcare sector.

Example 3: Developer of a project



Identify potential project areas or sites in line with objectives.

Outline current sources of natural capital provision near site.

Set out capital costs of project.

Outline natural capital gain for each project.

Produce portfolio stating key metrics.

Example 4: Water stakeholders

Those who manage waterbodies and surrounding land are key stakeholders.

- The findings indicate there may be future opportunities for:
- Use of water for energy generation; and
- Integrated water quality and green space management:
- Health, recreation and amenity benefits from green space tend to be large compared with benefits of water quality; and
- Schemes where water quality improvements are accompanied by the creation of green spaces and infrastructure may be particularly effective.

Next steps

The current work provides a baseline assessment of the sources of natural capital around waterbodies in the IMC.

Prioritisation of project areas can be informed by comparing current provision of services with opportunities for improvements.

The next step would be to build a framework to evaluate site-specific investment options, incorporating capital costs and changes in natural capital value.

Learning outcomes

This project provided practical steps and support services to begin to embed a natural capital approach.

Tools for Decision Making

The Natural Capital Account and Ecosystem Services Opportunity Mapping Tool are practical tools and data repositories which help build the evidence base for project development, and are best used when in combination with other studies, local knowledge and ground truthing.

Project Commencement and Initial Development

The adoption of a natural capital approach is best suited to the earlier stages of project development. The Natural Capital Committee's 5 Steps of Natural Capital provides a useful framework to guide project development from inception helping shape project aims along with developing the evidence base.

Stakeholder Engagement

Effective communication and engagement is key to good project development. During the early stages of project development it is important to take time to explain natural capital as a process to gain buy in.

Understanding Limitations

Fully reviewing the methodology and guidance notes for the Natural Capital Account and Ecosystem Services Opportunity Mapping Tool is important to understand and express to stakeholders the limitations of the tools.

Learning outcomes cont’d

- **Ecosystem Services Opportunities for all Assets**
- The Ecosystem Services Opportunity Mapping Tool was primarily developed to identify assets with the greatest potential to provide improvements to ecosystem services and subsequent natural capital uplift. The tool can also be used to identify assets of low opportunity, which often represent assets which are functioning to a high level and should be safe guarded.

- **Funding Resources:**
- The Natural Capital Accounts provide a powerful resource when reviewing and completing funding applications. The figures can be used to establish current valuations and the potential impact of proposed of projects.

- **Networking and Collaborative Approaches:**
- Through understanding the benefits and beneficiaries derived from existing assets and their ecosystem services, project developers can identify and work collaboratively with stakeholders who share the benefits. Through a collaborative approach, project developers can share responsibilities and resources with stakeholders and potentially identify joint funding applications.

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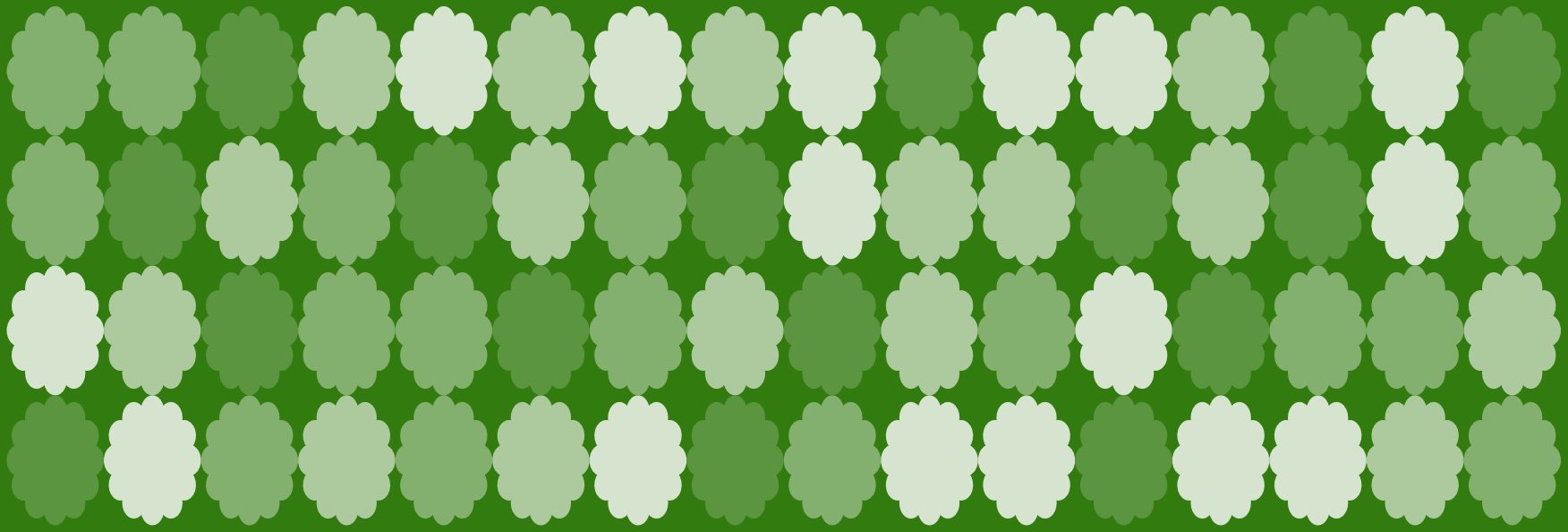

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Building the natural capital evidence base: Flood and Coastal Risk Management opportunities in the Northwest

Bruce Munro & Will Maclennan

Environment Agency


Clean air


Clean & plentiful water


Thriving plants and wildlife

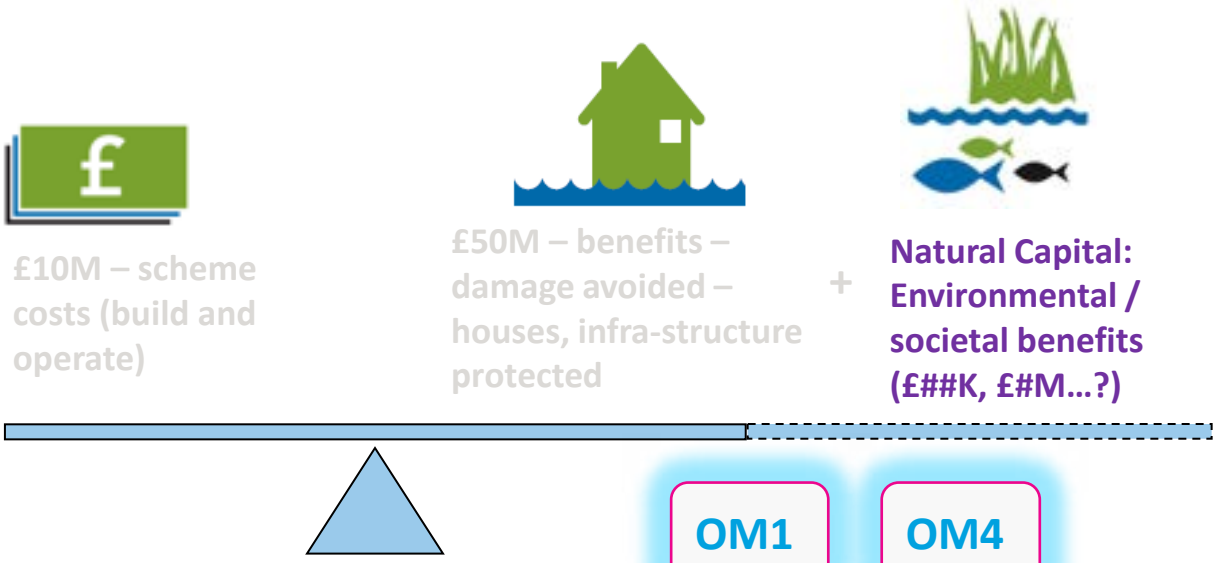

↓ risk harm env' hazards


Using resources more sustainably


↑ engagement with environment

Environment Agency

Why consider Natural Capital in Flood Investment?



Flood "Benefits Register"

+ potential partnerships, external funding

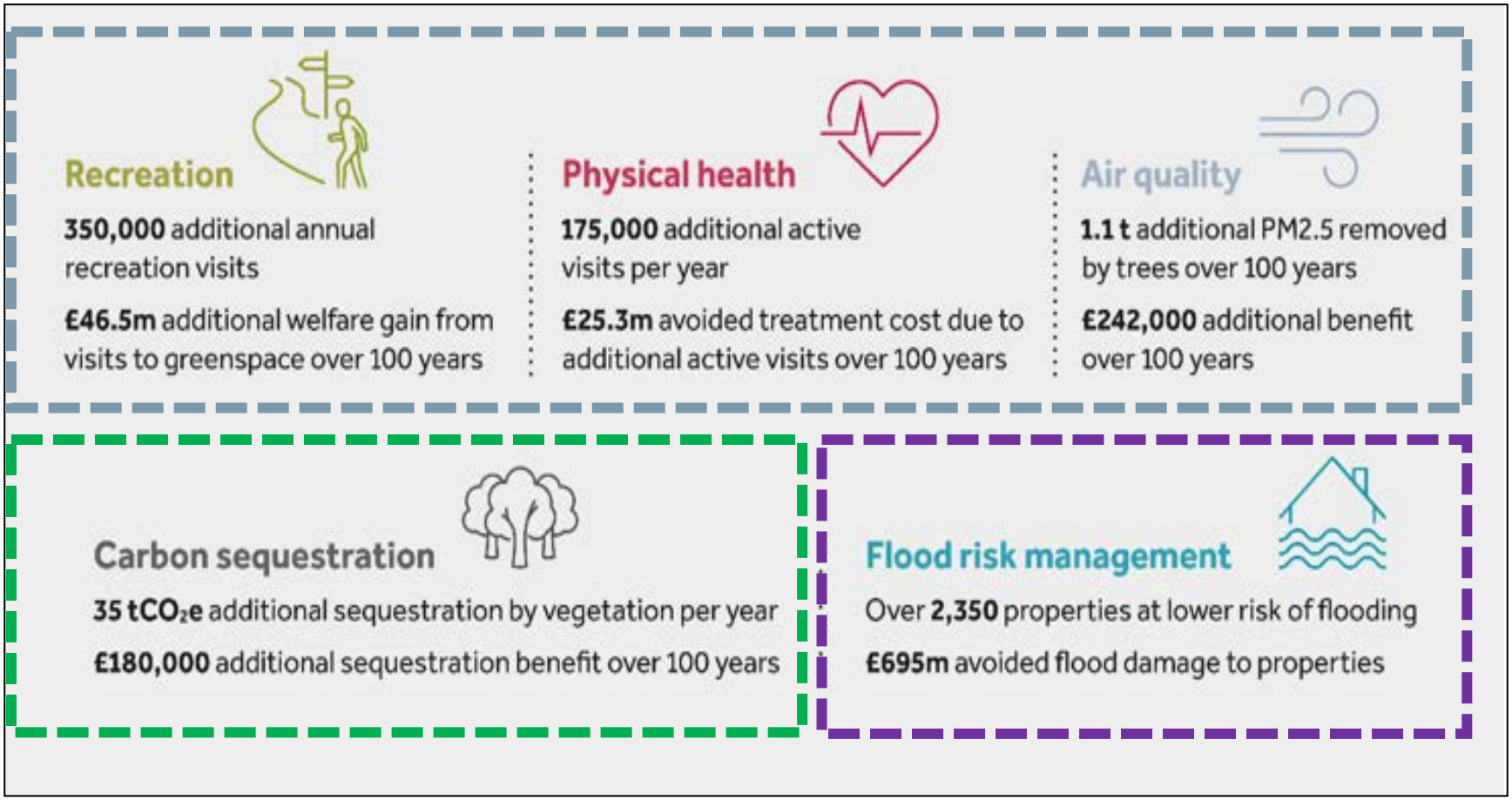
Why consider Natural Capital strategically?

- Explore **candidate** flood projects – establish +al benefits **early**
- Develop prj's that consider NC opportunities & benefits – ***from the outset***
- Support Catchment, Integrated Delivery, NFM, Biodiversity ↘ Carbon

Environment Agency

Mersey Warrington Flood Scheme - Natural Capital assessment

Quantification & valuation of benefits



Environment Agency

EA NW Natural Capital mapping – the story so far…..

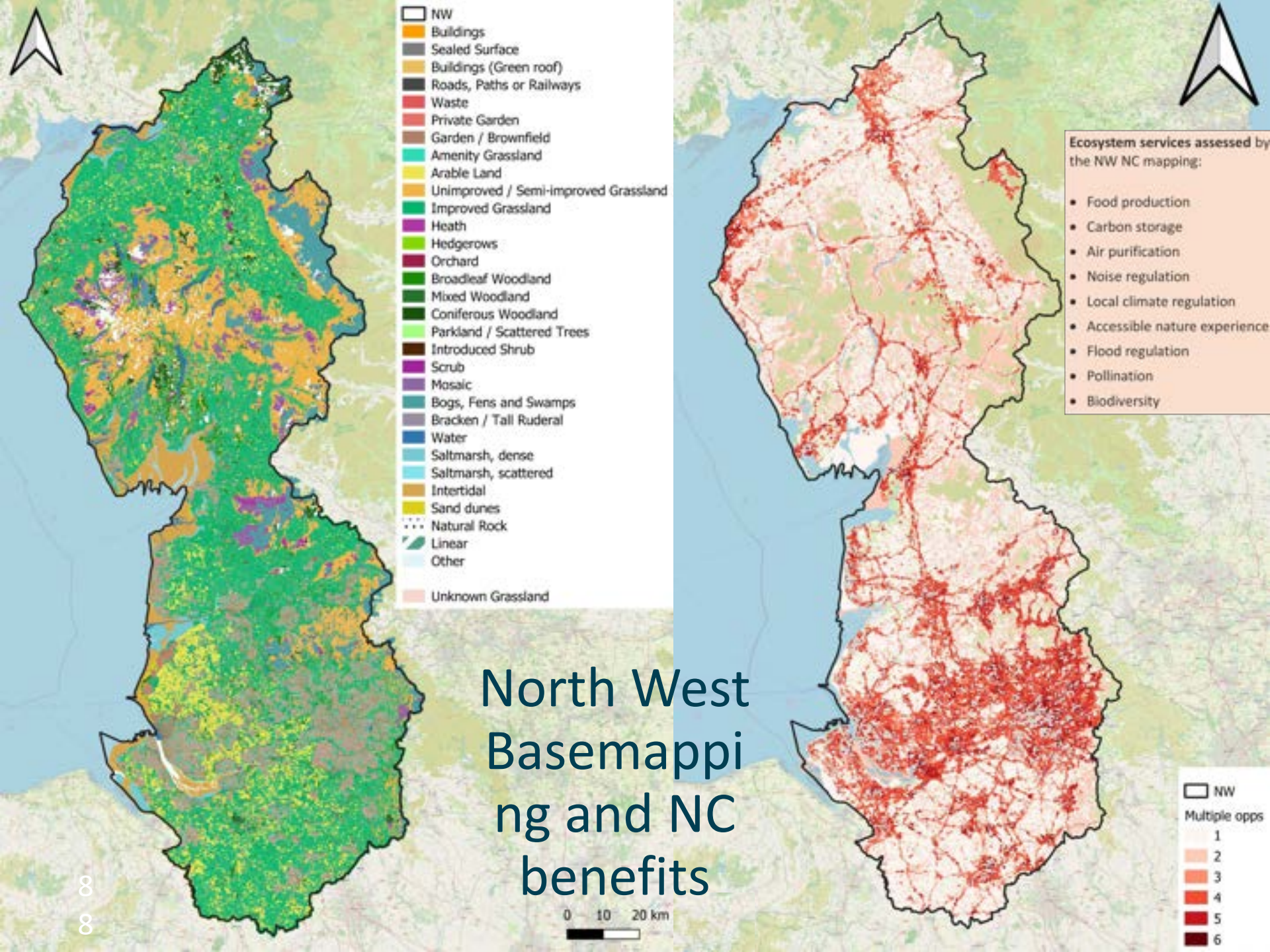
- Scoped range of NC tools & approaches
- Liverpool JMU ‘Ecoserv-R’ GIS & ES mapping
- Single mapping system – whole NW region
- Hosted on EA ‘Pipeline Opportunities’ platform
- EA flood information + ES / NC all in one place.

Key aims:

i. Consistent, spatial baseline

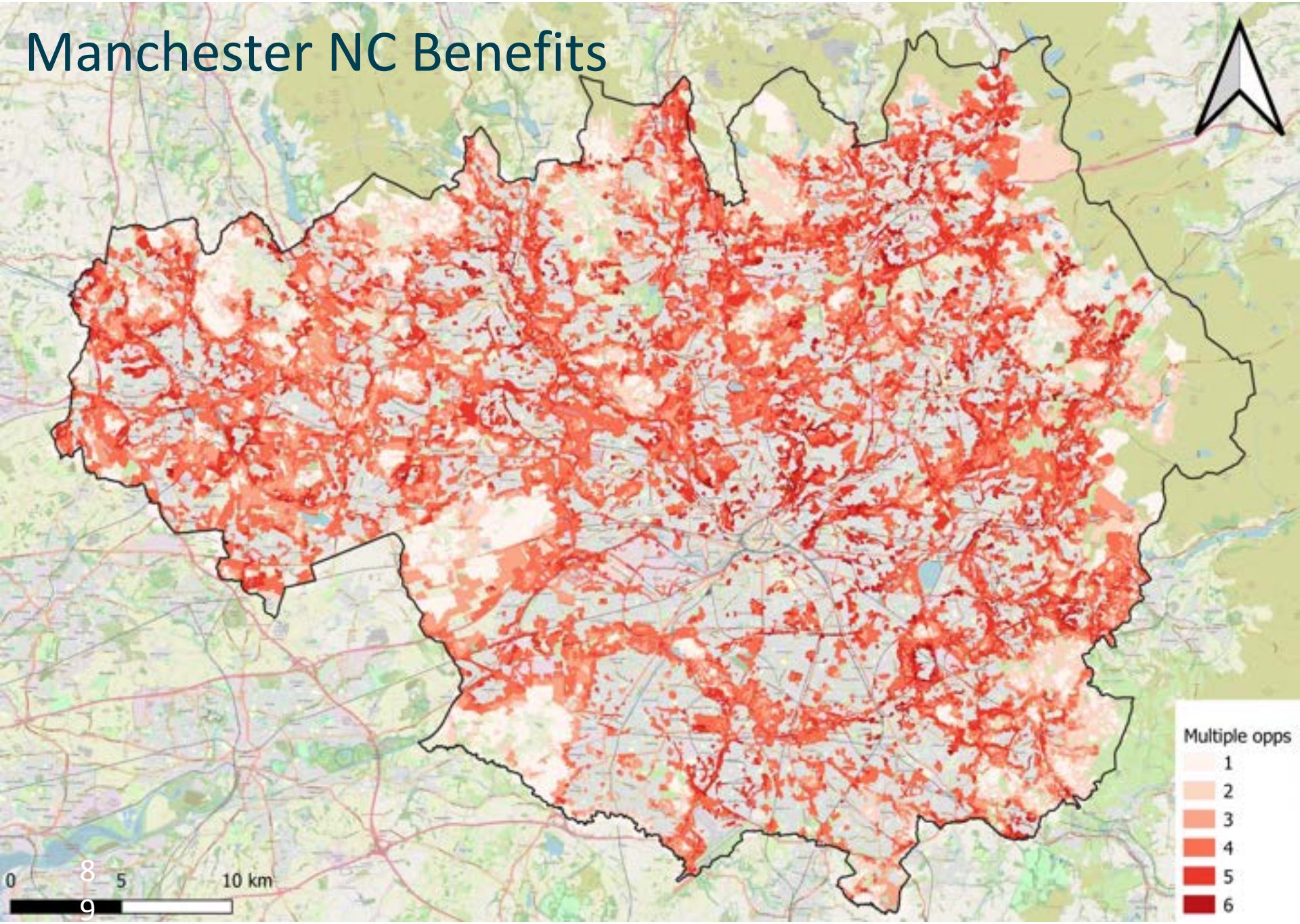
ii. Range of scales: catchment > river reach

iii. Quantify change >>> potential £ / funding

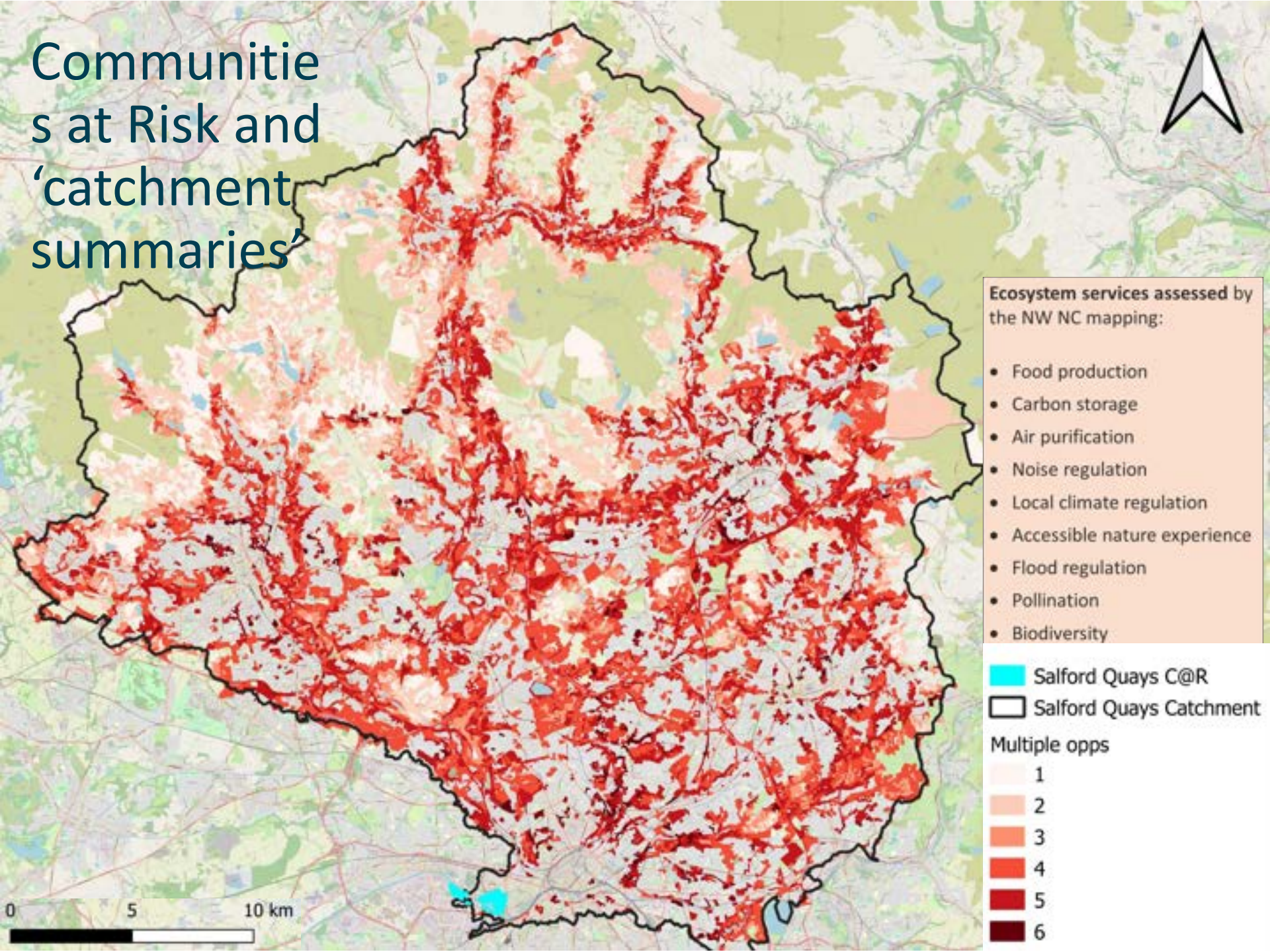


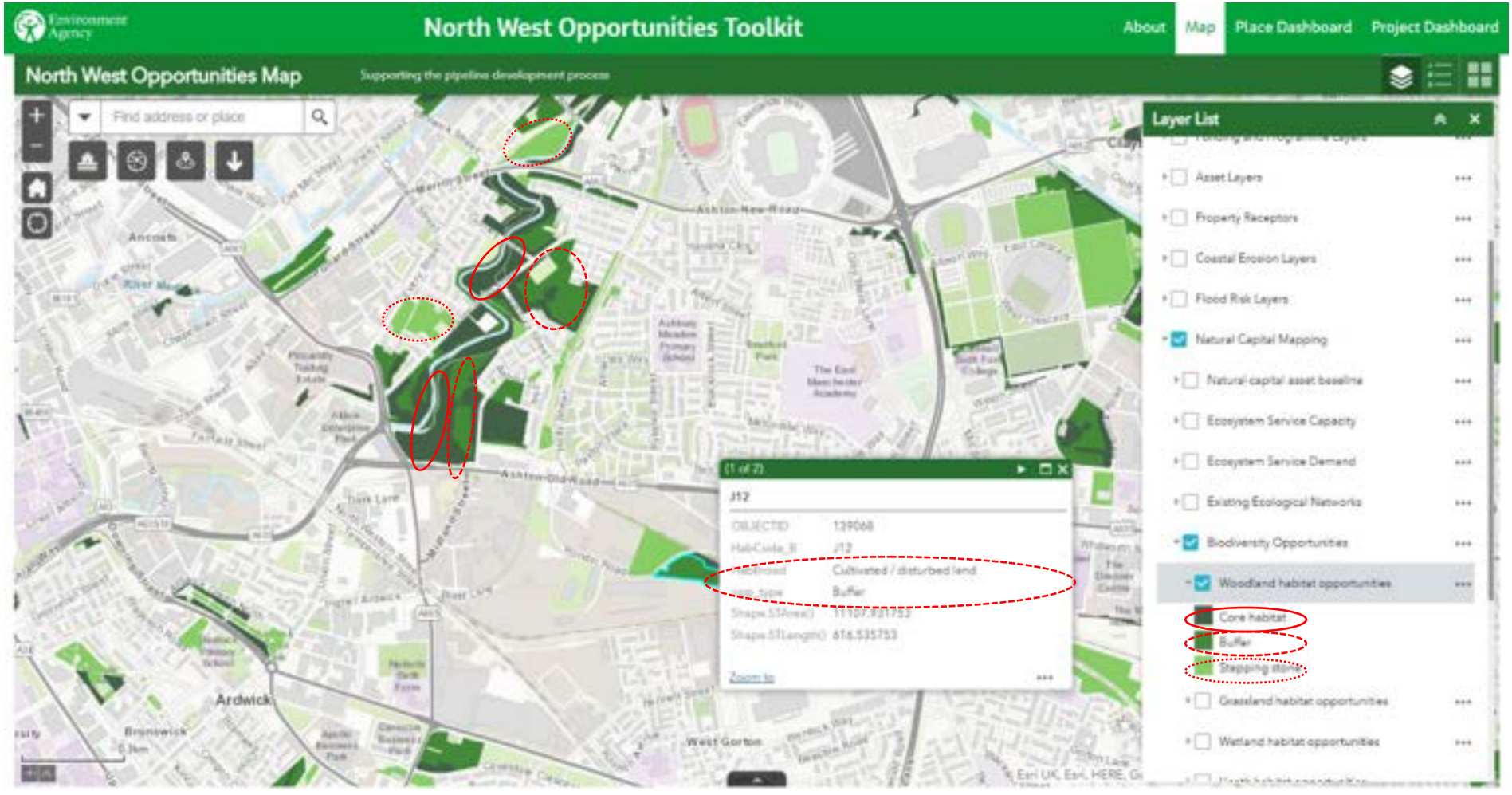
North West Basemapping and NC benefits

Manchester NC Benefits



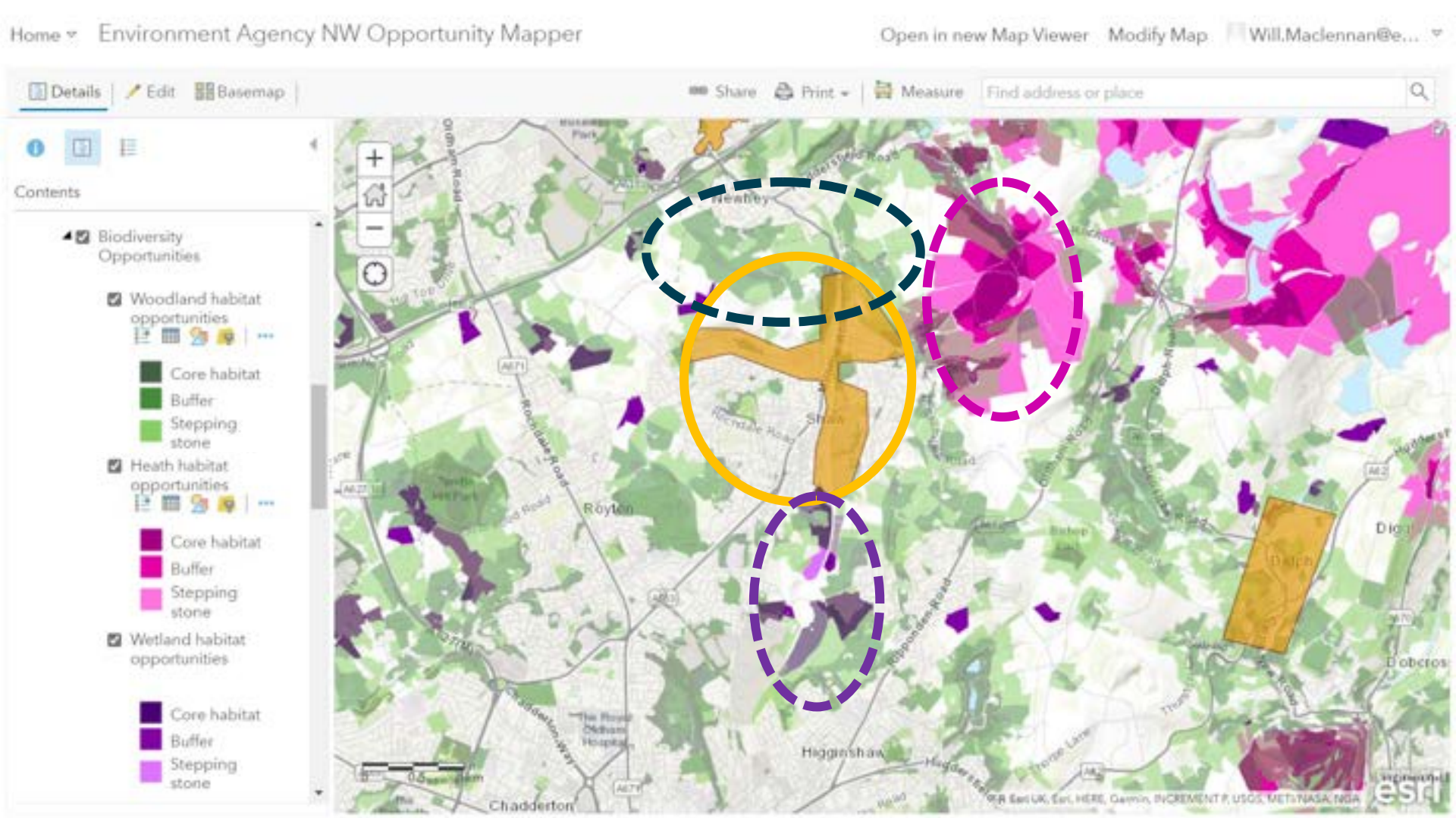
Communities at Risk and 'catchment summaries'





Biodiversity Opportunities group:

- Existing 'core habitats' dark green.
- Polygons where habitat creation would expand existing: '***buffer opportunities***'
- Or enlarge + enhance ecological connectivity: '***stepping stones***'.
- Clicking a polygon brings up attributes, incl. current habitat type to evaluate whether conversion is feasible or desirable.



Shaw Case Study:

- Shaw project opportunity layer
- Opportunities for Woodland creation to the North
- Opportunities for Wetland creation to the South
- Opportunities for Heath Habitat (peatland restoration) to the NE.

NW Natural Capital mapping – next steps

- Include using of NC mapping to help influence early stages of projects (project 'integrated mandates')
- Identify multiple benefits early
- Help define Project objectives
- Wider scope > Flood risk + catchment / NFM
- Range of NC benefits – unlock alternate funding opportunities
- Greater functionality – include 'interventions' to measure change in NC benefits
- Training – EA teams and suppliers

Environment Agency

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Thank you!

Questions / discussion?

Environment Agency

A BRILliant action plan: Bringing the River Irk to Life

Charlotte Sugden & Anne Harding

ATKINS
Member of the SNC-Lavalin Group

Environment Agency

Life

Overview

- Project background
- BRIL action plan approac
- Natural Capital Assessme
- Final action plan
- Lessons learnt
- Case studies
- Project progress

https://live.staticflickr.com/2220/2197489823_6d10b70e98_b.jpg

https://s0.geograph.org.uk/photos/04/58/045814_1f8cf285.jpg

Project background

https://www.researchgate.net/profile/Rodolfo-Alves-Da-Luz/publication/311824694/figure/fig1/AS:442183502307328@1482436170741/Greater-Manchester-main-rivers.png

- Bringing the River Irk to Life (BRIL).
- Funded by Natural Course.

  Environment Agency project, delivered with Atkins.

- River Irk runs from outskirts of Oldham to Manchester City Centre, and has a long history of physical modification and water quality issues.
- Aims to transform the Irk (and its tributaries) into a vibrant river corridor, bringing nature and people together in harmony.
- 10-year project vision to form a green corridor connecting Manchester City Centre, Oldham and Rochdale.

Environment Agency ATKINS

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Project background

What is the BRIL action plan?

- A list of actions based on environmental need and opportunity aiming to:
  - Improve the river and riparian environment (including water quality, morphology and biodiversity)
  - Increase public access to green and blue space
  - Provide socio-economic benefits

What will it be used for?

- Drive improvements in water quality, river morphology and natural capital such as biodiversity
- Leverage funding and investment to deliver the actions

BRIL action plan approach

Consultation with steering group, stakeholders and public

Baseline data collation and review

Identification and development of actions for environmental improvement

Review of investment streams and development of high-level funding strategy

Prioritisation exercise to short-list actions

Action plan development, including Natural Capit
Biodiversity Net Gain assessments for top 20 act

Environment Agency

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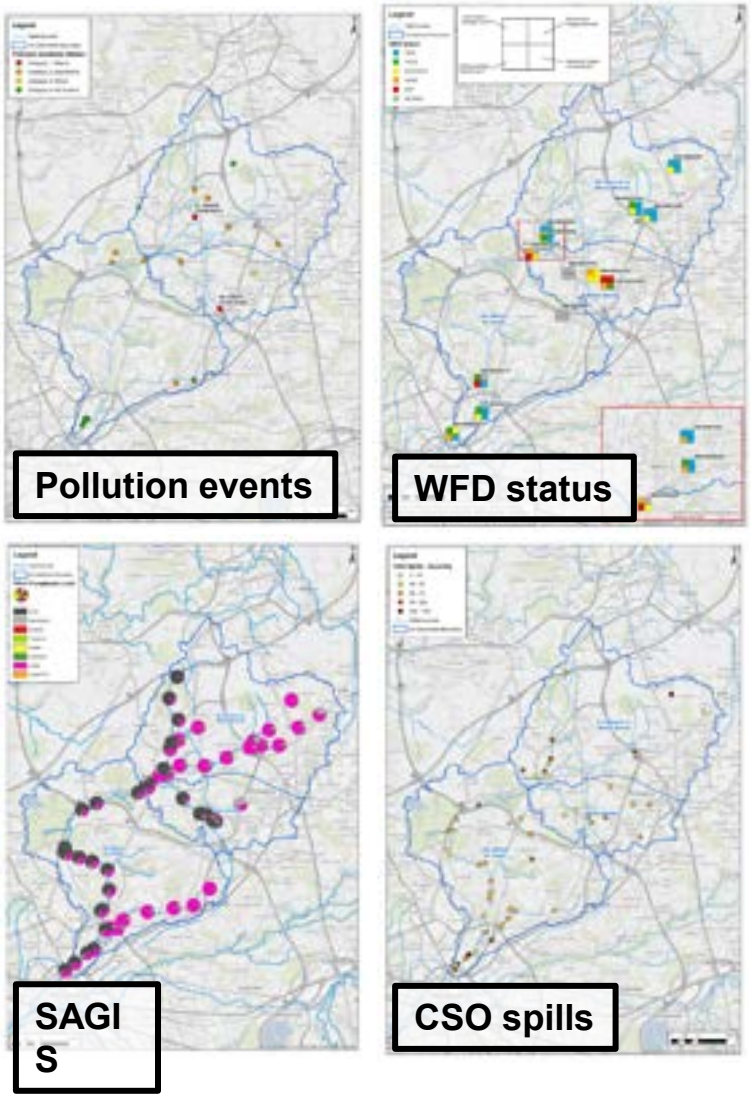
BRIL action plan approach

Data collation and action development

- Review and analysis of existing data
- Collate local knowledge and information
- Identification of actions to help improve the Irk for the environment and people

Prioritised actions

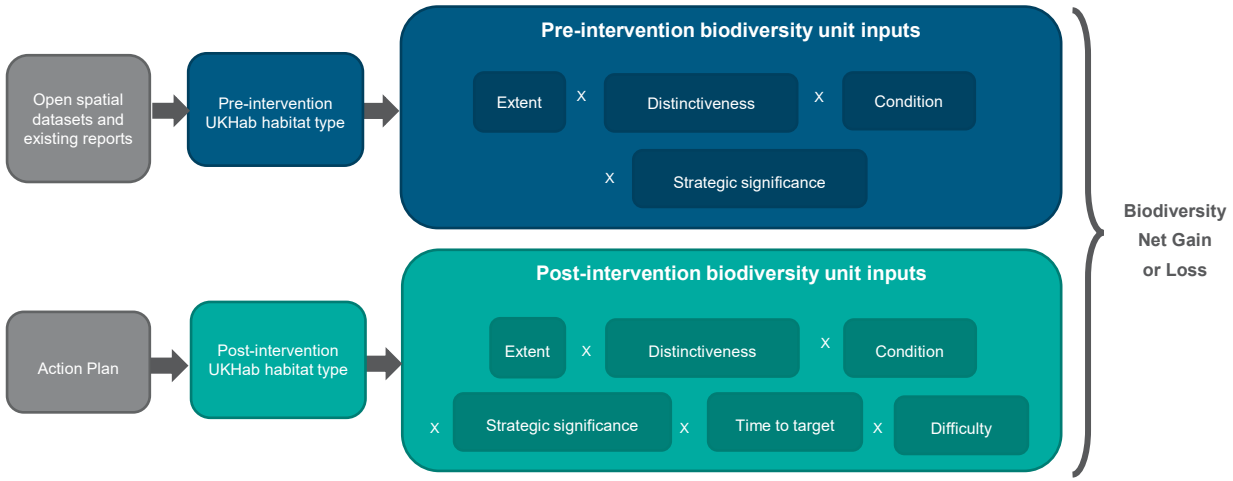
- Multi-criteria analysis for shortlisting
- Based on environmental improvement, climate change, funding, socio-economic benefit and feasibility
- Top 20 for further development



BRIL action plan approach

Biodiversity Net Gain assessment

- A desk-based assessment to give an indication of BNG credits of each action
- Looking at both **habitat creation** and **condition improvements**



BRIL – Natural Capital Assessment

Figure 1 Environment Agency Natural Capital Logic Chain

Step 1: Qualitative assessment

- Literature review and data collation
- Qualitative assessment

Step 2: Quantitative assessment

- Quantify impacts
- Quantify relevant populations/ stocks

Step 3: Valuation

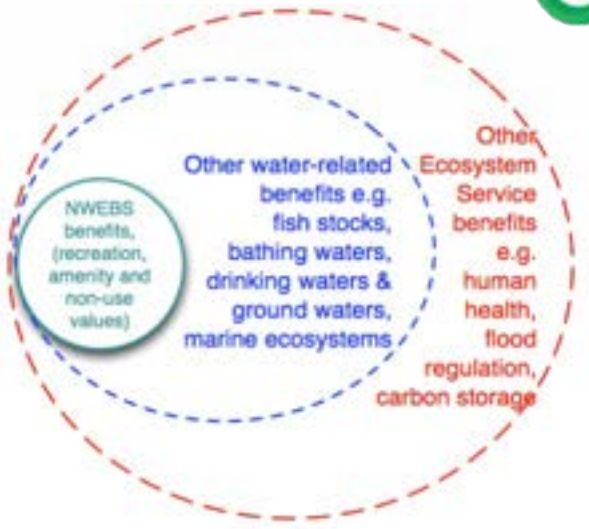
- Select and apply relevant valuation data

Step 4: Sensitivity analysis

- Sensitivity analysis using second assessment method

BRIL – Natural Capital Assessment

- High-level costing of the actions
- Monetising the benefits of the actions with a focus on recreation, amenity and health, using:
  - NWEBS
  - B£ST
  - Orval
- Used to also provide a cost-benefit analysis



Environment Agency ATKINS

BRIL – Natural Capital Assessment

- ‘Fish’ is the NWEBS component that receives the greatest benefit from all actions followed by ‘invertebrates and other animals’
- The value of Amenity benefits were more significant than the NWEBS benefits for 16 of the top 21 actions
- The total benefits value does not assess all the possible ecosystem services meaning the results of the benefits assessment are best considered as a conservative estimate
- The cost benefit assessment can be used to prioritise actions further

BRIL – Natural Capital Assessment

The natural capital assessment values were compared to the costs to identify which actions provided benefits that outweigh the costs:

BCR > 1 = benefits outweigh the costs

BCR < 1 = costs outweigh the benefits

Action ID	30 year cost	30 year benefit	BCR
I2a.8	£138,086	£1,379,065	10.0
I2b.2	£409,419	£2,954,850	7.2
I4d.1	£611,160	£3,606,866	5.9
I5.3	£147,028	£653,166	4.4
I7a.1	£71,949	£270,463	3.8
WB1.2	£135,215	£426,892	3.2
I4b.3	£191,622	£546,230	2.9
I2a.9	£478,403	£908,295	1.9
I4a.1	£4,095,659	£8,736,075	2.1
I8a.1	£795,720	£1,394,454	1.8
I2a.12	£70,742	£130,734	1.8
I3.1	£361,263	£596,790	1.7
I2a.3	£256,140	£404,212	1.6
I7a.2	£380,232	£583,540	1.5
I4c.1	£780,484	£1,059,323	1.4
I8c.1	£874,372	£821,404	0.9
I1.3	£674,891	£661,229	1.0
I2a.1	£18,979	£12,602	0.7
WB3.1	£2,475,200	£993,486	0.4
I2a.2	£546,028	£161,738	0.3
MB1.1	£15,137,044	£2,953,960	0.2
TOTAL	**£28,649,637**	**£29,255,376**	1.0

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BRIL action plan approach

Funding Strategy

- Identified the beneficiaries and stakeholders for each of the top 20 actions
- Outlines the potential wider benefits of actions, e.g. BNG, flood risk, carbon capture
- Matches potential funding streams with each of the actions
- Documents the wider opportunities for funding of other actions
- Starts [illegible] ages between those who may wish to be involved with actions and the project

BRIL action plan approach

Consultation

- Throughout the development of the action plan
- Steering group, stakeholders and members of the public
- All online using interactive web maps and a series of and

Final action plan

[Irwell Catchment Partnership Evidence Review Tool (arcgis.com)]

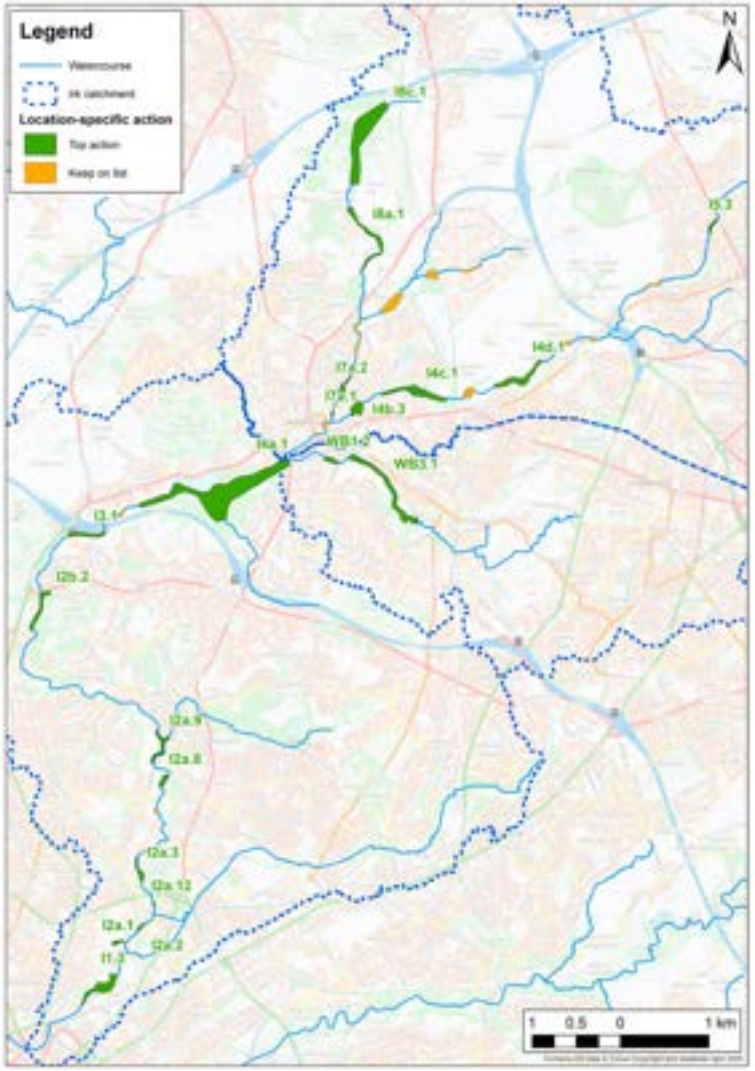
Action Rank #3 (joint): I1.3 – Structure removal and restoration

Improving fish passage – Rock ramp, bypass channel or step pool, restore channel and reconnect floodplain, create wetlands.

BENEFITS DELIVERED	
Improve water quality	✓
Improve habitat	✓
Improve hydromorphology	✓
Encourage community engagement	✓ ✓ ✓
Improve recreation	✓ ✓ ✓ ✓ ✓
Potential to reduce flood risk	✓ ✓
Help to mitigate climate change	✓ ✓

CONSTRAINTS	
Contaminated land constraints	
Infrastructure constraints	
Landownership constraints	
Feasibility score	8/11

FUNDING INFORMATION	
Potential natural capital value	
Total action cost	
Potential terrestrial BNG improvement	
Potential riverine BNG improvement	



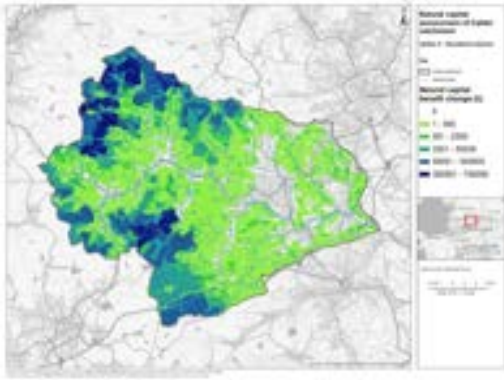
Lessons learnt – what went well

- **Collating baseline information** and **developing the actions in GIS** throughout the lifetime of the project.
- Making a list of **key objectives for actions** at the start of the project ensured actions were focused on the objectives.
- Creating a **draft list of prioritisation criteria** early on in the project and ensuring data to answer these was collected and populated through the project.
- Ensuring **key catchment and stakeholder priorities/drivers** were included within the prioritisation criteria.
- Using the **story maps for stakeholder engagement** when asking for ideas of actions, so that actions are given a spatial location from the start.
- Using story maps to **collect feedback** on the actions, so the comments are linked to the actions as well as contact info for interested parties in the different actions.
- Using **natural capital** and high level costing to develop **early indication of BCR** to enable prioritisation.

Lessons learnt – improvements

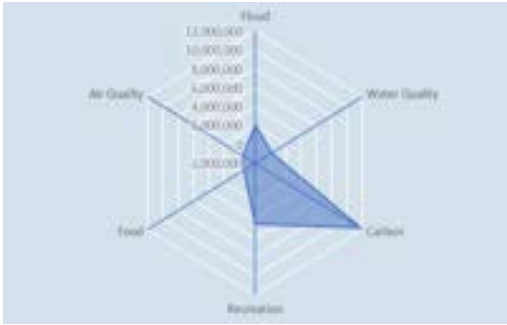
- **Site visits** early on to give a less abstract understanding of the catchment.
- **Spatial data** on contaminated land, land ownership and utilities mapping early on.
- **Cost benefit assessment** on all actions in order to feed into prioritisation.
- **Short-list** using specific natural capital metrics.
- Using a **wider range of natural capital assessment tools** to maximise the potential economic benefits.
- **Earlier communications** with landowners and with partners may have helped in better supporting understanding and identifying funding routes.
- Wider input into the **beneficiaries identification** earlier on to ensure **local knowledge** was captured earlier and earlier identification of potential funding partners.
- **Quantifying benefits** can be challenging at conceptual design stage – **more detail = more confidence.**

Calder Valley: the wider benefits of Natural Flood Management



Challenge: To understand the benefits of NFM and the wider natural capital metrics to help inform the long term NFM strategy in the Calder.

Approach: Apply NFM Studio, with updates which allow NFM Studio models to simulate peatland and moorland restoration as a land use change scenario.

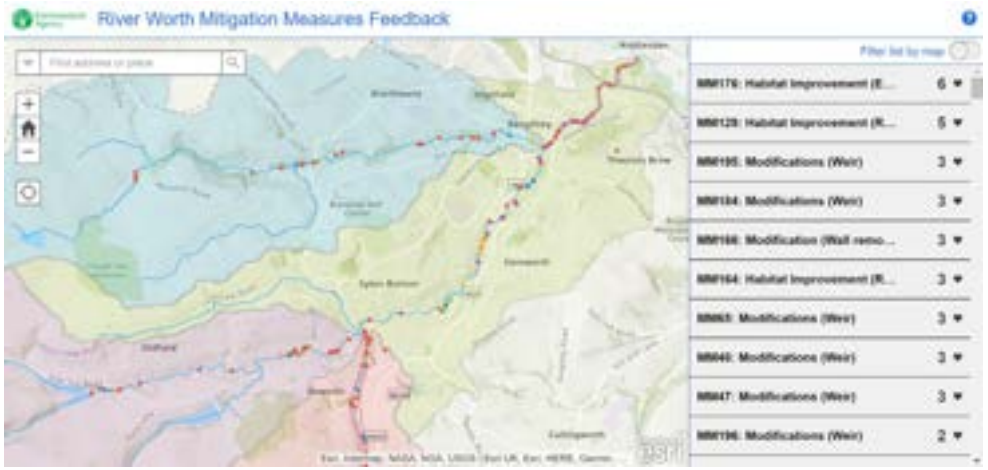


Outcome: a spatial quantification of the improvements to natural capital assets across the Calder catchment. Including quantification of the impact of peatland restoration within the soil recovery NFM option. The total benefit of NFM options to ecosystem services within the Calder catchment ranges from **£498m to £114m,** depending on the option.

So what?: This is an example of how natural capital assessments are used to value th Environment Agency ATKINS g nature-based solutions at scale.

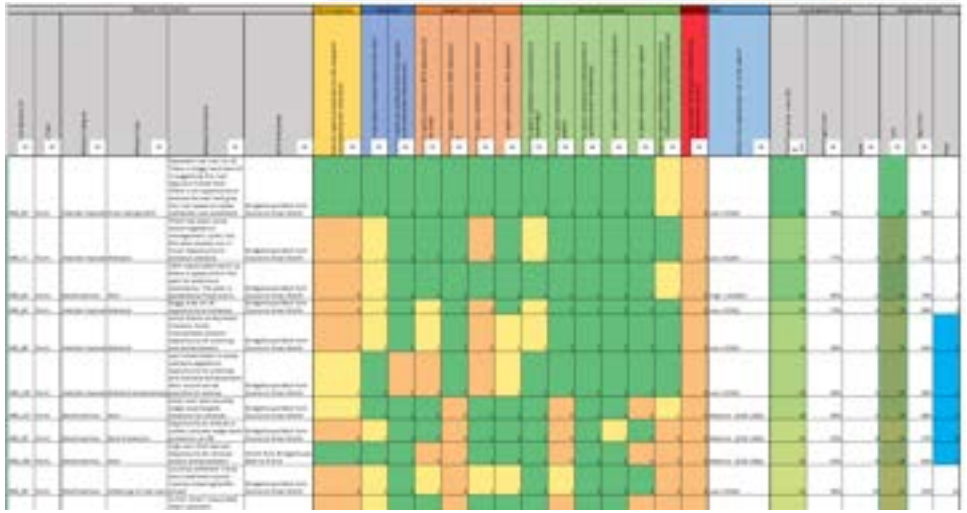
River Worth: catchment action plan

- Linked to 2x FAS planned in catchment at Haworth and Keighley
- Understanding environmental need
- Identifying outline actions which could be delivered by the schemes
- Establishing BNG baseline for FAS boundaries (UKHab and MoRPh)



River Worth: catchment action plan

- Action prioritisation exercise utilising approach developed for BRIL
- Bespoke multi-criteria analysis developed for project and client:
  - Like-for-like FAS mitigation?
  - Targets/objectives (WFD, BNG, OM4s)
  - Multiple benefits
  - Constraints and costs
- Next steps: Environment Agency ATKINS into FAS design, detailed development of options, community engagement,



BRIL progress

- The Action Plan has now been adopted by the Irwell Catchment Partnership
- Secured funding to investigate improvements at Collyhurst & Harpurhay Weirs
- Hoping to use the Action Plan to influence the mitigation of the Victoria North development
- Outputs used by Greater Manchester Ecology Unit who are gathering information on potential locations for BNG for Biobanking

https://www.groundwork.org.uk/wp-content/uploads/2019/10/UK-river-1.jpg

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COURSE
Questions?
ATKINS
Member of the SNC-Lavalin Group
Environment Agency
Life

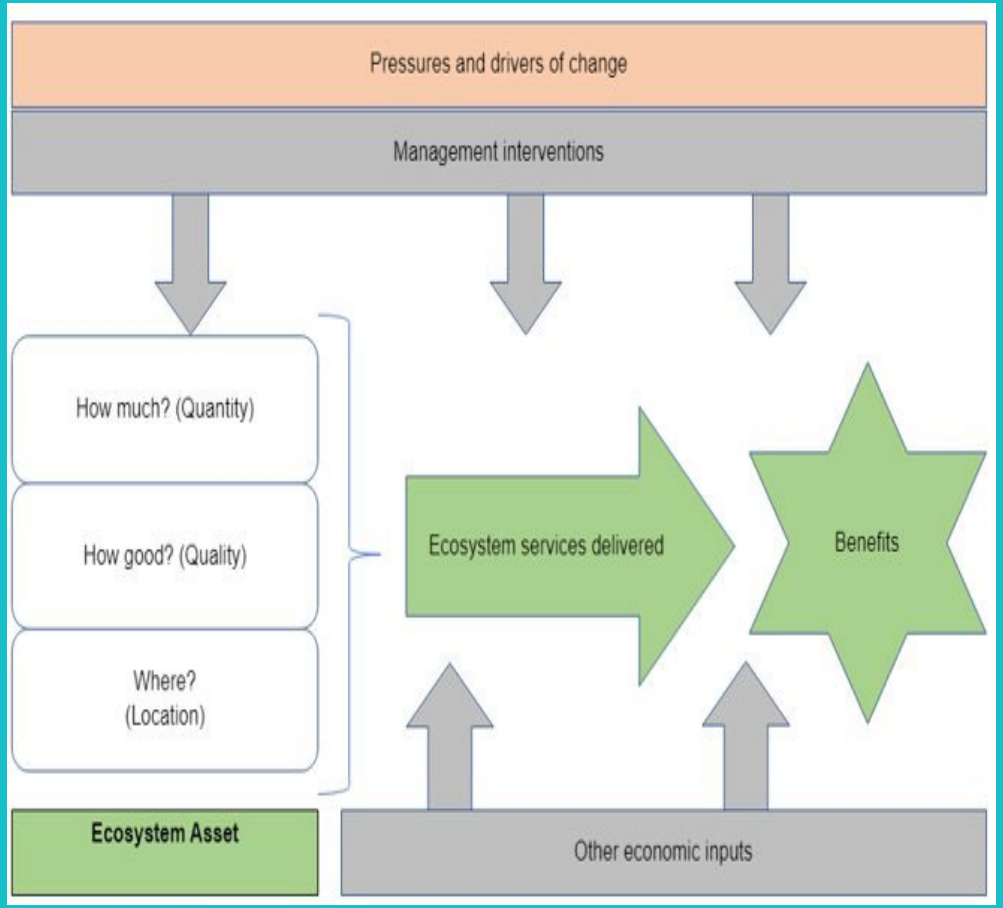
Using Natural Capital Farm Plans as a catalyst for engagement with Landowners.

Action C10: Cheshire Hub

Natural Capital Farm Plans as an Engagement Tool

Objectives:

- Provide landowners, tenants with information about Natural Capital opportunities to improve farm environmental impacts whilst balancing profitability
- Identify the resources needed for Natural Capital interventions and how resources can help sustain long-term benefits from the natural environment
- Ensure Natural Capital is embedded in ongoing business of the farm and the wider estate



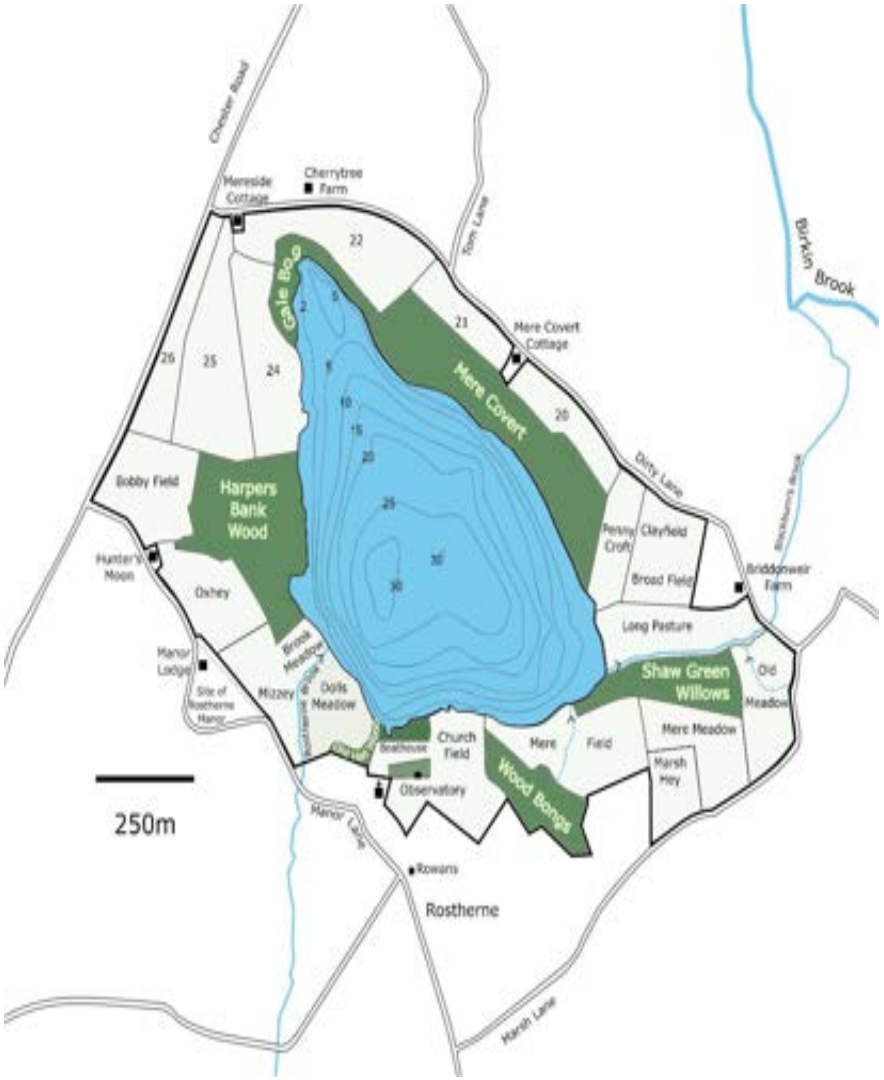
Tatton Estate: Rostherne Mere Case Study

Reducing the impacts of rural diffused water pollution

- Rostherne Mere – Ramsar, SAC, SSSI and NNR
- Nutrient annual load:
  - Phosphate 390kg
  - Nitrogen 11,710kg
- Approximately 54% of source apportionment from Agriculture
- Nutrient Targets for SSSI Favourable Condition;
  - Phosphate = 80% reduction
  - Nitrogen = 75% reduction
- WFD status: Ecological (bad), Biological (bad), TP (bad), Macrophytes (bad), DO (poor)
- Sewage discharges redirected from 2018

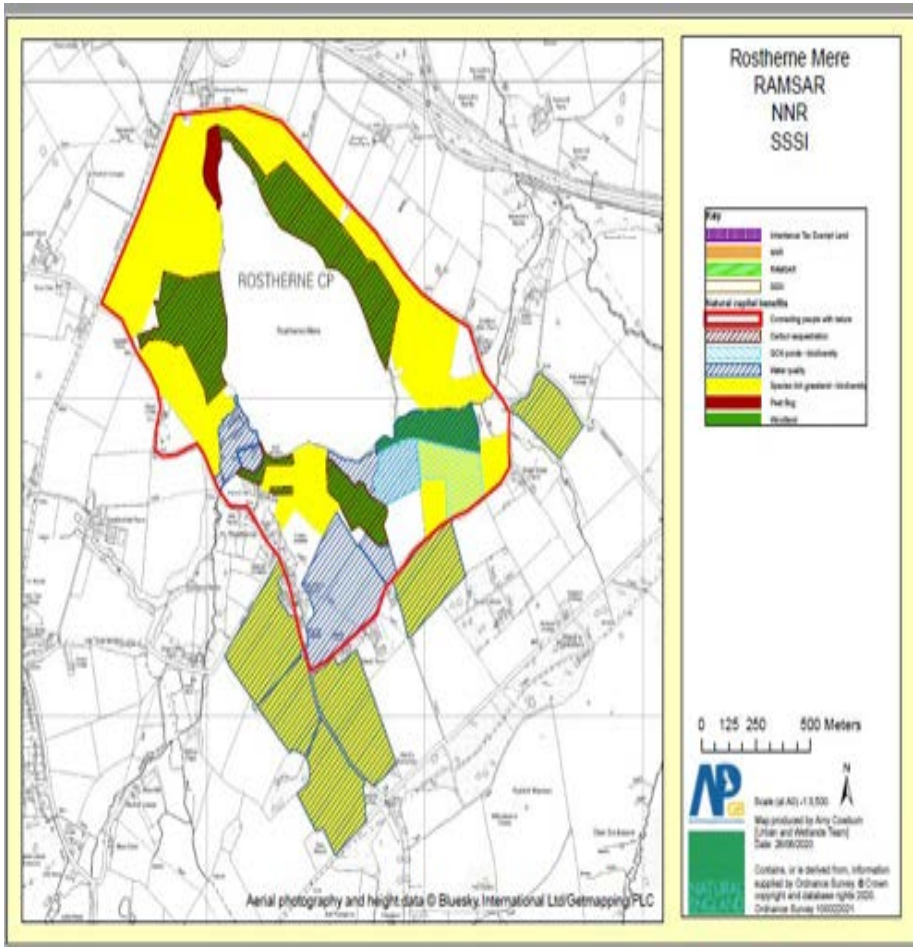
Rostherne Mere: Land Management Challenges

- NNR managed by Natural England
- Historic and ongoing issues with problematic tenants
- Environmental damage to reserve including multiple breaches of SSSI consented management activities
- Increased nutrient run-off due to poor soil management
- Additional pressures from live stock over stocking/grazing, poaching especially over winter months!



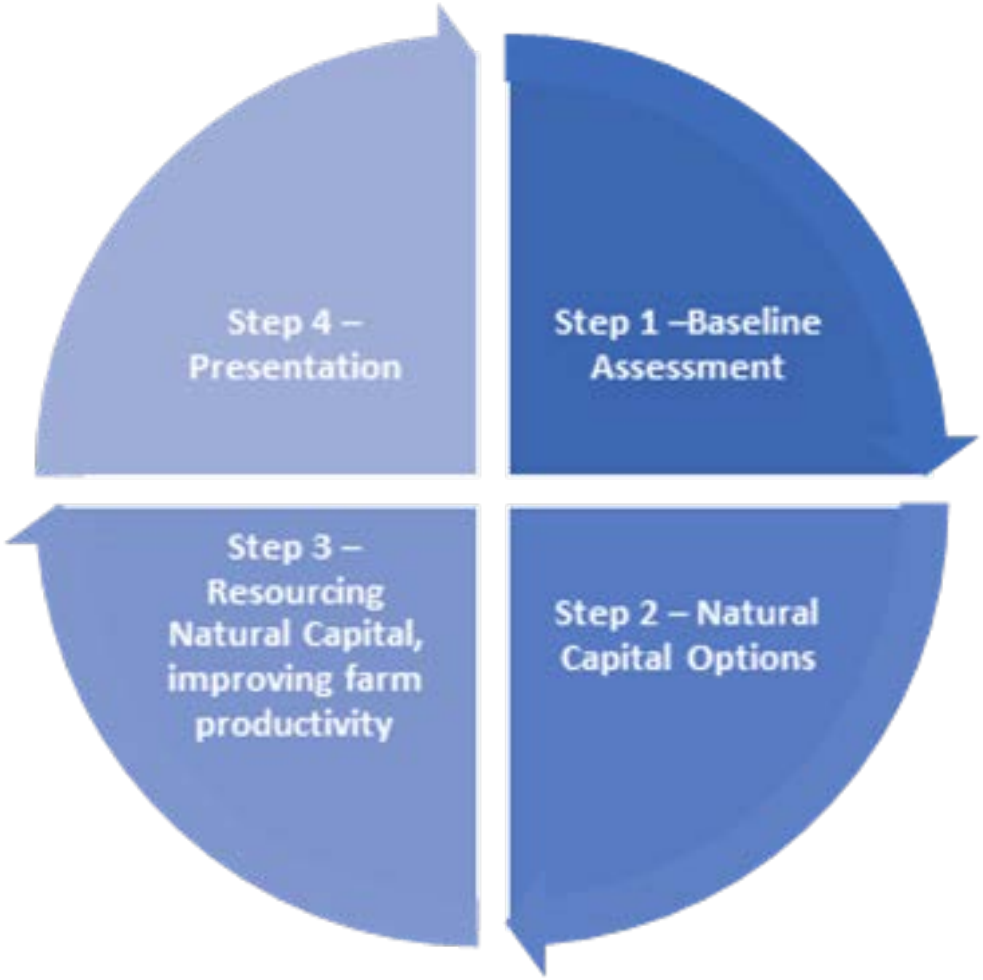
Rostherne Mere: Land Owner Engagement - The Tatton Estate

- Proactive early engagement with the Estate
- Understanding environmental impacts of current practices
- Proposed land management changes based on a Natural Capital approach to deliver multiple environmental improvements
- Cleaner water
- Thriving plants and wildlife
- Resilient to climate change
- Sustainable land management



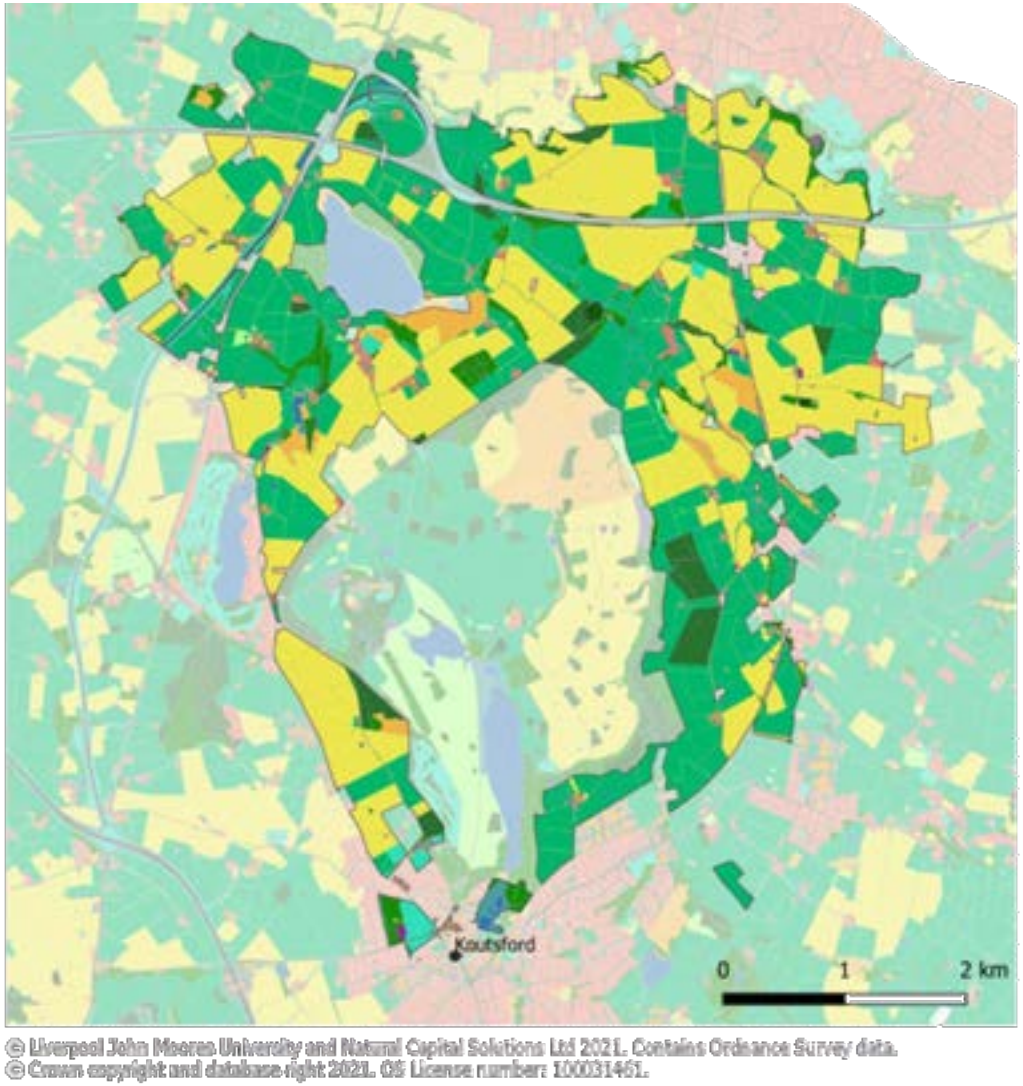
Farm Plans – Process

- 4-step process to develop Natural Capital interventions that would improve the environmental quality and support sustainable land management transition.
- Assessed 79 Natural Capital interventions, amounting to 45 ha of land use or management change.



Farm Plans – Step 1 Baseline Mapping

- Existing GI audit formed the baseline for the study.
- Natural Capital information sources brought together on GIS.
- Gap analysis of areas where Natural Capital assets are under provided based on needs.



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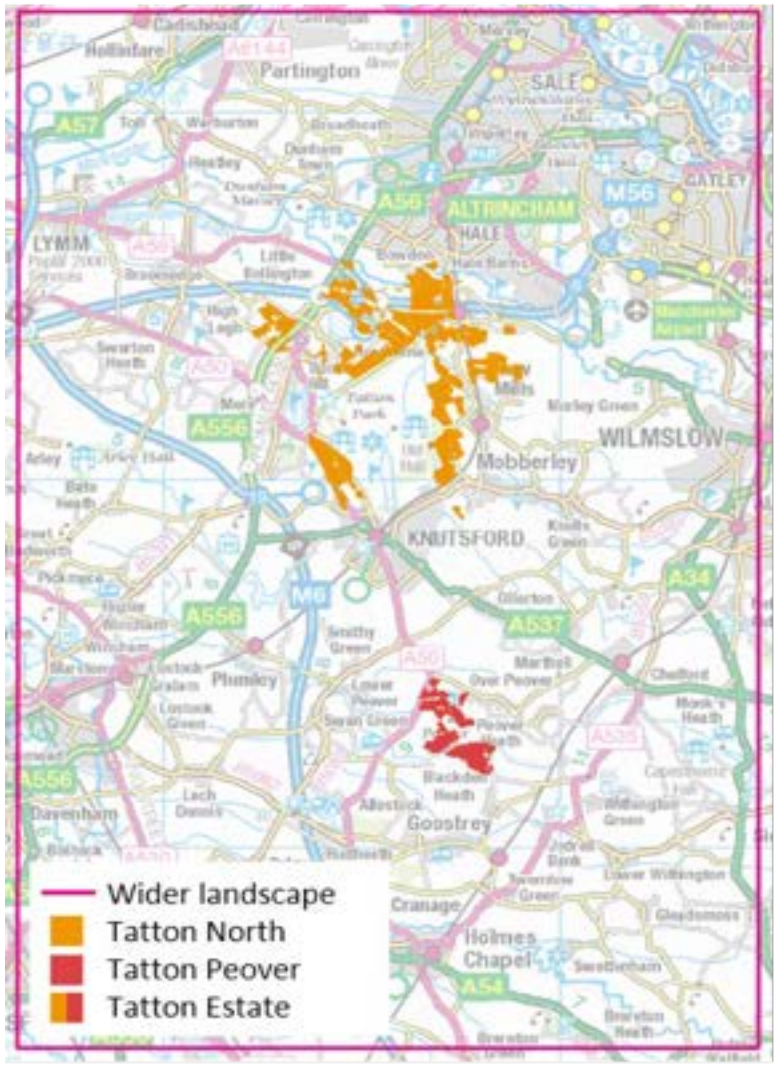
Farm Plans – Step 2 Natural Capital Assessment

- Looked at less productive sites where:
  - Natural Capital uplift can be achieved with little impact on farm business.
  - Delivery of increased productivity alongside natural capital benefits may influence future ELM/ natural capital based payments
- Walkover surveys were conducted by Environment Land Management (ELM) Associates
  - Suggested 79 interventions, ranging from hedgerow improvements and grass margins through to wetland creations and woodland establishment identified.
- Natural Capital benefits of interventions were assessed using the Ecosevr tool developed by John Moors University
  - Benefits ranged from water/air purification, carbon storage and access to nature.
  - Suggested interventions increased the delivery of seven ecosystem services at the four geographic extents considered across wider Estate.

Farm Plans –Step 2 Natural Capital Assessment



	Percentage Change (%)			
Ecosystem Service (Capacity)	Wider Landscape	Tatton Estate	Tatton North	Tatton Peover
Accessible Nature	0.23	3.57	4.09	1.06
Air Purification	0.18	4.10	4.82	1.15
Carbon Storage	0.08	3.05	2.87	4.19
Local Climate Regulation	0.52	8.48	11.80	1.97
Noise Regulation	0.23	3.96	4.54	1.62
Pollination	0.02	0.55	0.40	1.38
Water Purification	0.04	1.23	1.44	0.01

Farm Plans –Step 3 Resourcing Natural Capital

Assess the economic impact of interventions identified from the Natural Capital assessment on farm business;

- This was carried our using a new economic model developed by Fisher German for Mersey Forest.
- Costs to the business - delivery costs/management of the interventions over 30 years and vs the loss of productive land capacity
  - £34K loss over a 30-year period to the farms if interventions were carried out
  - Woodland only option that showed a net benefit (£30k), but this doesn't consider potential deprecation of land value or the expected increase in carbon benefits or net gain from these projects
- Income that could be generated via grants and other income sources or through decreased costs of farm inputs if land taken out of production.

Farm Plans – Step 4 Outcomes

- Better relationship with Tatton Estate.
- Tatton Estate have expanded Natural Capital assessment to all land holdings.
- 6.4ha of new woodland created on Tatton Estate.
- Mersey Forest secured Natural Environment Investment Readiness Fund for Bollin Valley.
- Land brought back in hand at Rostherne Mere.
- Discussions continue about other opportunities….

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THE MERSEY FOREST
more from trees

Life

Farm Plans – Outcomes - Wetland Creation

Tatton Estate -Sustainable Land Management

- Removal of problematic tenants from the reserve
- Arable reversion
- Lower stocking rates/seasonal rotational mixed grazing regime
- Rewilding of wildflower meadows
- Countryside Stewardship scheme for surrounding fields outside reserve to help reduce diffused water pollution
- Ongoing water quality monitoring
- A further 2 areas of wetlands been created together with a third area underway.

Farm Plans as Catalyst for Landowner Engagement – Headline Lessons

- **Natural Capital Farm Plans-** Demonstrate the value (financially) of doing things differently.
- **Independent Expert Engagement** – It's not statutory agencies or regulators advising them/telling them what to do!
- **Land Agent Influence –** Need to build them into the process/conversation early.
- **Show and Tell** – Show them what their peers are doing, build confidence through facilitating mutual engagement and information sharing.
- **Show Off** – Allow them to take the credit for the changes that they have made even if you've facilitated them. This will lead to them wanting to do even more.

Petula Neilson

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The Catchment Based Approach (CaBA)

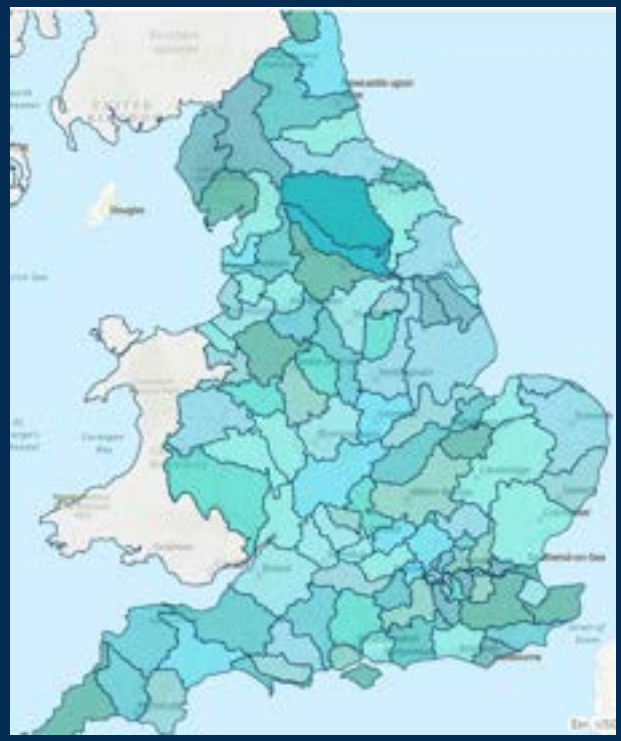
Collaborative Water Management across England

Rob Collins – The Rivers Trust
rob.collins@theriverstrust.org

Catchment Based Approach

The Catchment Based Approach (CaBA)

- Established 10 years ago – recognition of ‘bottom-up’ approach
- 106 river catchment Partnerships encompassing the whole of England
- Diverse mix of partner organisations – connecting public, private and civil society



Catchment Based Approach

- Convening power
- Pool resources
- Capture local expertise
- Leveraging of additional funds

https://catchmentbasedapproach.org/

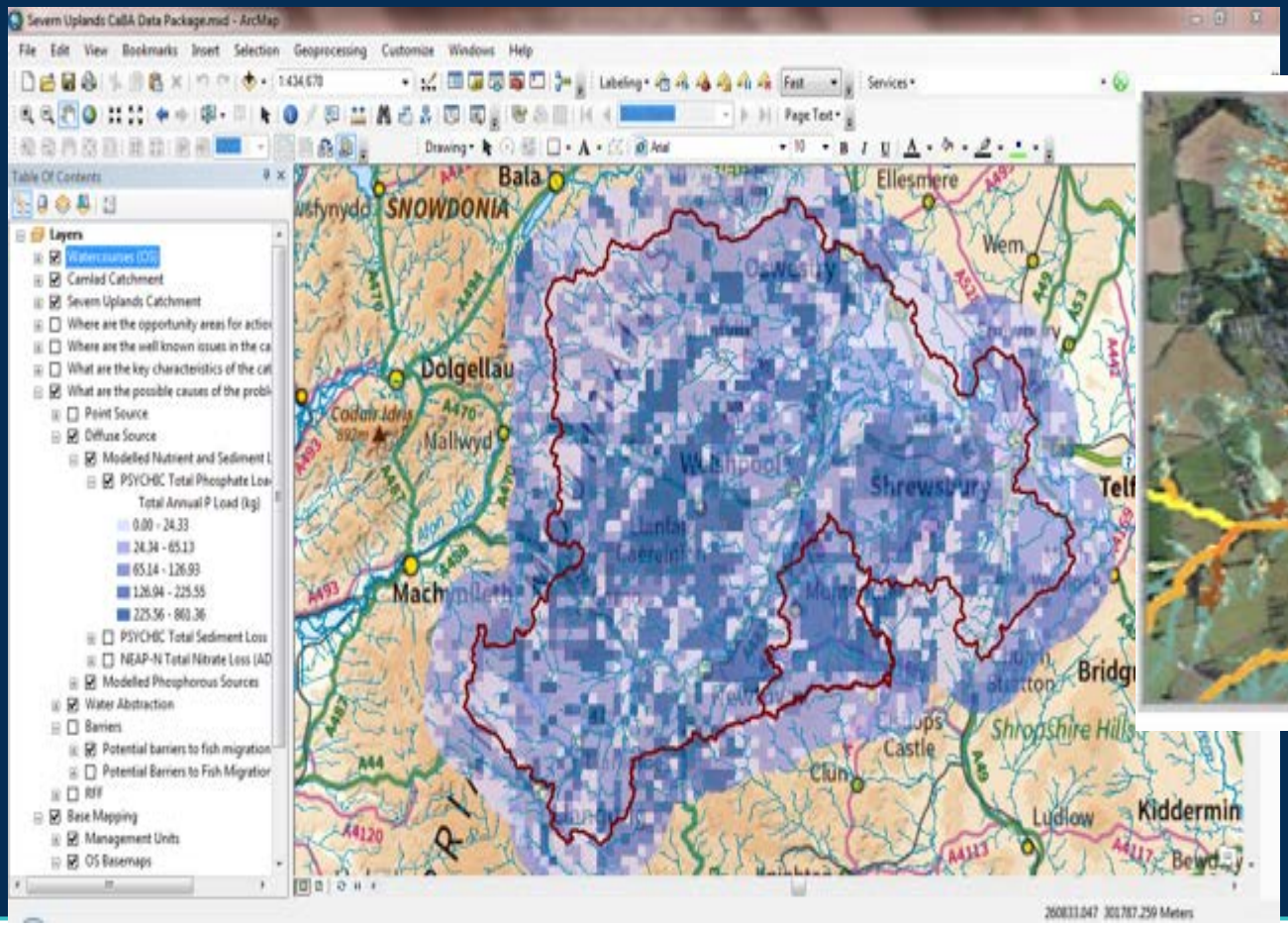
Catchment Based Approach

National CaBA Support Group

Underpinned by Data and Evidence

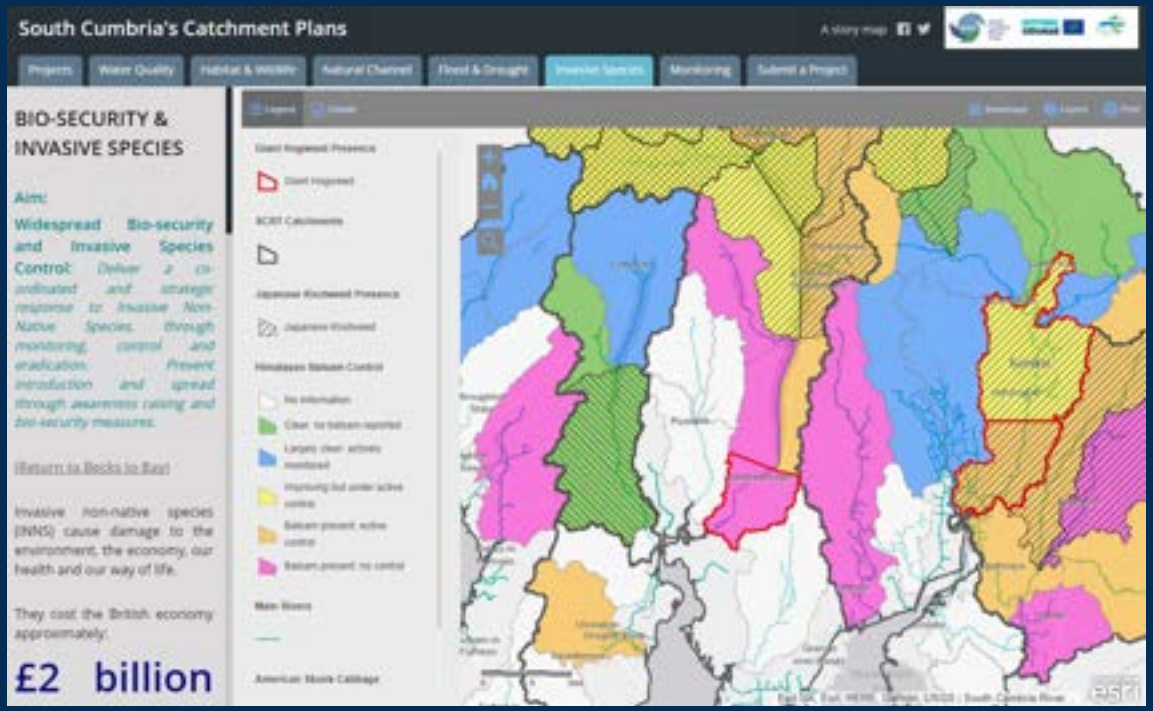
Catchment Based Approach

CaBA Data Package – 200+ data layers



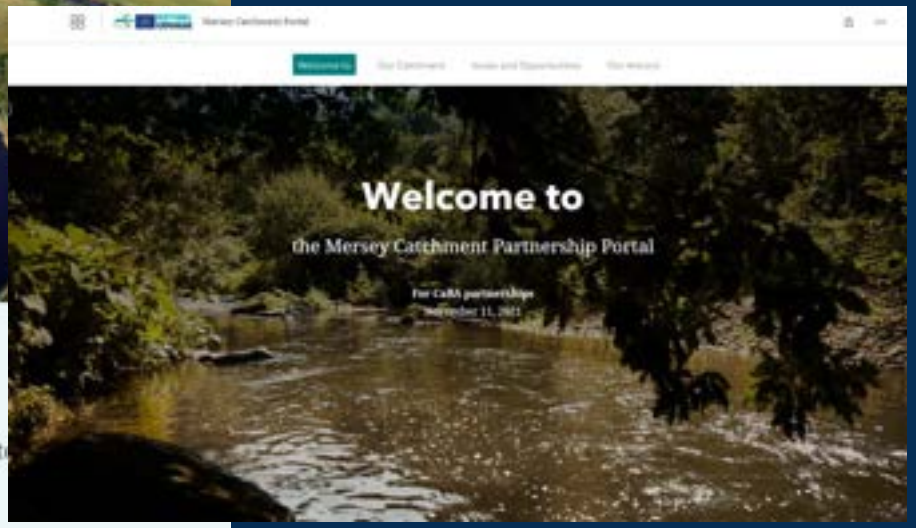
Catchment Based Approach

Catchment Plans



Catchment Based Approach

Shared Information Platforms and Storymaps



Catchment Based Approach

Collaborative Delivery

underpinned by Natural Capital
and
Stakeholder Engagement

Catchment
Based Approach

Northwest Farm Hub

United Utilities are funding a structured agricultural network across their operational area

Network consists of catchment partnerships and the farm cluster groups they manage

Implement nutrient interventions and achieve common goals across a catchment

Catchment Based Approach

- Drive a collaborative, closer working model between Coastal Partnerships and CaBA Partnerships and hence improve integration across the land-sea interface

- Improve understanding of the state of estuarine and coastal waters

Marine Management Organisation

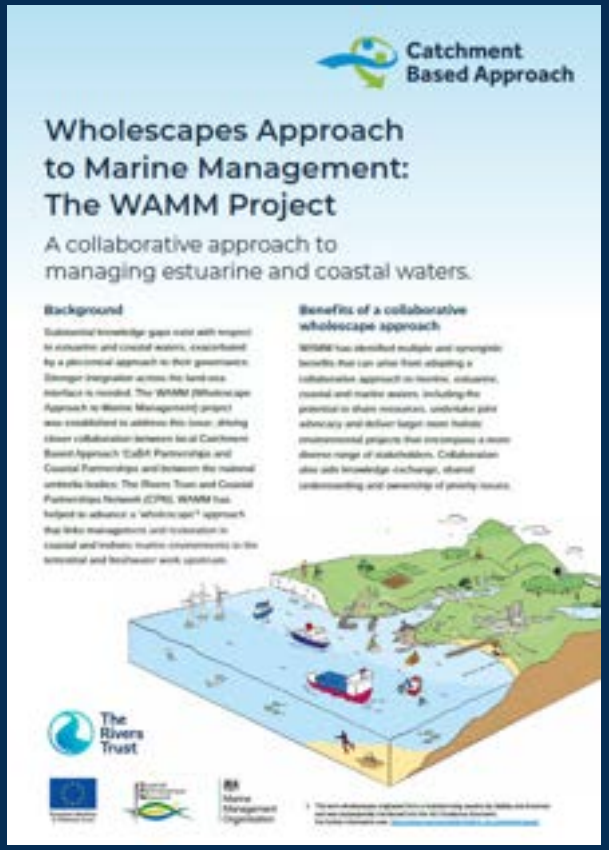
European Maritime & Fisheries Fund

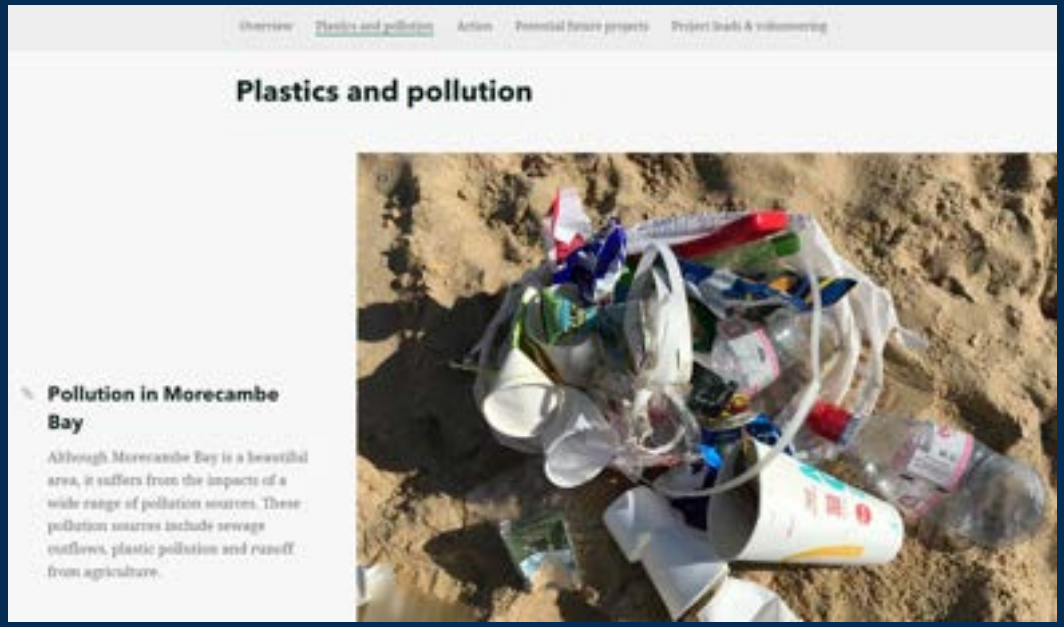
Coastal Partnerships Network

Catchment Based Approach

Morecambe Bay Pilot

- Drive a collaborative approach across the 4 partnerships, for the longer term; Morecambe Bay Coastal Partnership, 3 CaBA Partnerships (led by Wyre, Lune & South Cumbria RTs)
- Improve understanding of the state of coastal and estuarine waters
- Improve understanding of the link between freshwater/catchment processes and the Bay





Catchment Based Approach

Tree Planting for Multiple Benefits

Optimal Targeting

- Habitat
- Soil type
- Flood risk
- Land use

Ribble Rivers Trust

NATURAL COURSE | Environment Agency | GREATER MANCHESTER | The Rivers Trust | United Utilities

Catchment Based Approach

Tree Planting for Multiple Benefits

Farmer/Landowner engagement

- Free advice & guidance

Volunteer opportunities

Ribble Rivers Trust

Natural Course | Environment Agency | Natural England | Greater Manchester | The Rivers Trust | United Utilities | EU

Catchment Based Approach

Hillylaid Wetlands

- Original wetland area drained for housing
- Surface water flooding
- Poor water quality, coastal bathing nearby

Wyre Rivers Trust
"from Bowland to Bay"

Catchment Based Approach

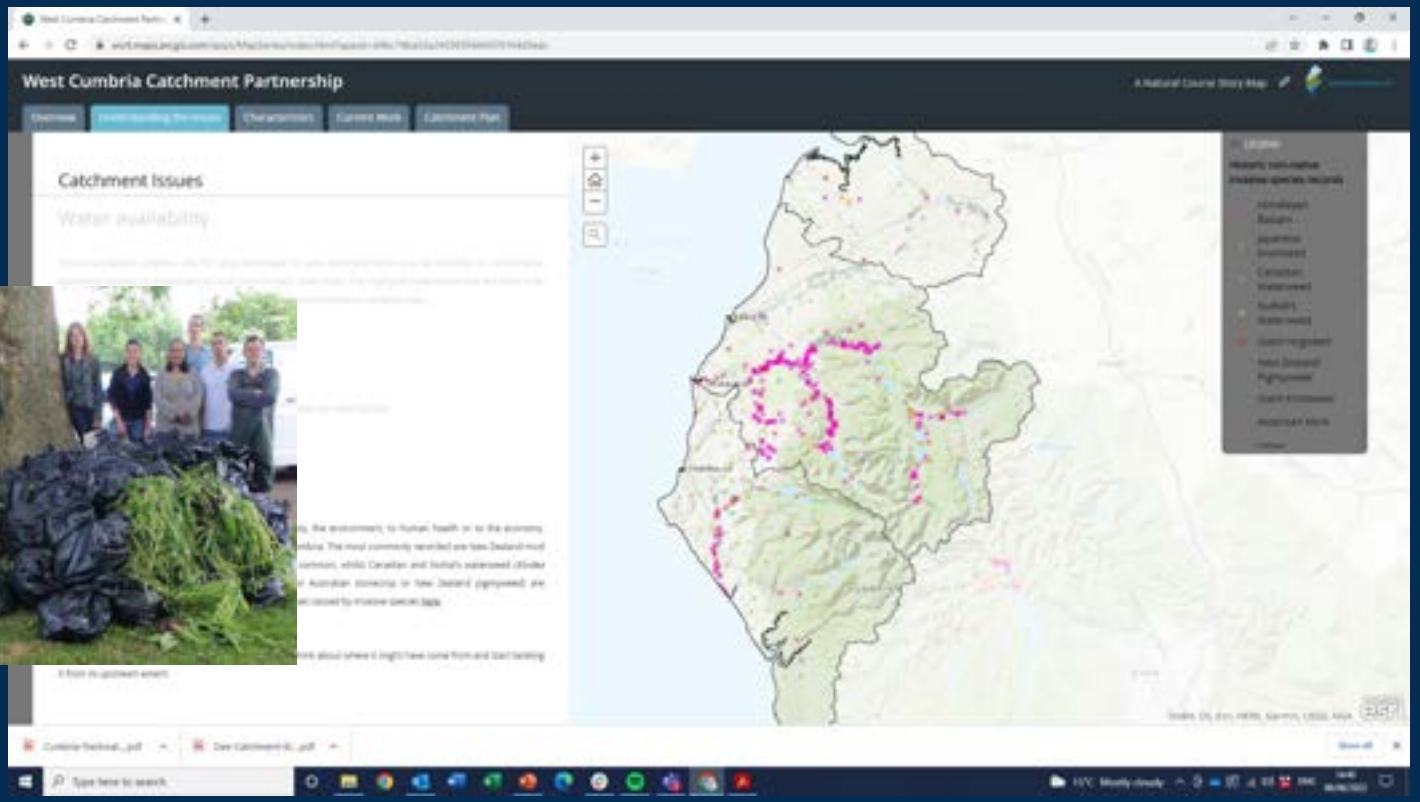
Hillylaid Wetlands

- 6,000 m^3 of flood storage
- Attenuation of pollution
- Reconnection of a paleochannel
- Biodiversity benefits
- Community engagement – planting up

Wyre Rivers Trust
"from Bowland to Bay"

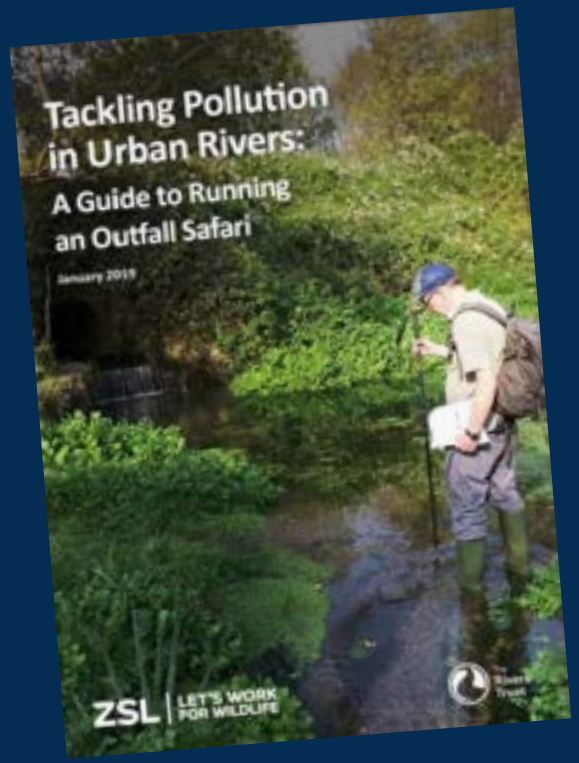
Catchment Based Approach

Tackling Invasive Species



Catchment Based Approach

Tools and Guidance for Citizen Science and Volunteers



Catchment Based Approach

Many elements of the CaBA approach will be applicable in other countries

Thanks

The Rivers Trust

Catchment Based Approach

Natural Course

Natural Capital Workshop – 26 April 2023

Using a natural capital approach to developing a business case for environmental improvements

Case study - Wyre Catchment NFM project

Dan Hird

nature finance

Wyre Catchment NFM project

Project initiation – back in 2018 and 2019

The original idea: how to create a commercial model for NFM in a UK river catchment

The adviser/intermediary

Project development funding ££

Wyre Catchment NFM project

One of the four earliest pilot projects in the UK

Triodos Bank

one of four UK pilots initiated

Why funded?

- UK Government 25 Year Plan for the Environment (2018).
- COP26 – UK a leader in natural capital investment. (2021)

These projects effectively became the pilots for Defra's £10m NEIRF programme – which is now funding 77 projects

nature finance

Wyre Catchment NFM project

Step 1 - Organise the project and multiple stakeholders

Buyers
Landowners
Investors
Grant providers
Core project team
Project steering group
Community

FLOOD RE

United Utilities

Environment Agency

We don't have any yet…

We don't need any yet…

WOODLAND TRUST

The Rivers Trust

Wyre Rivers Trust

nature finance

Esmée Fairbairn Foundation

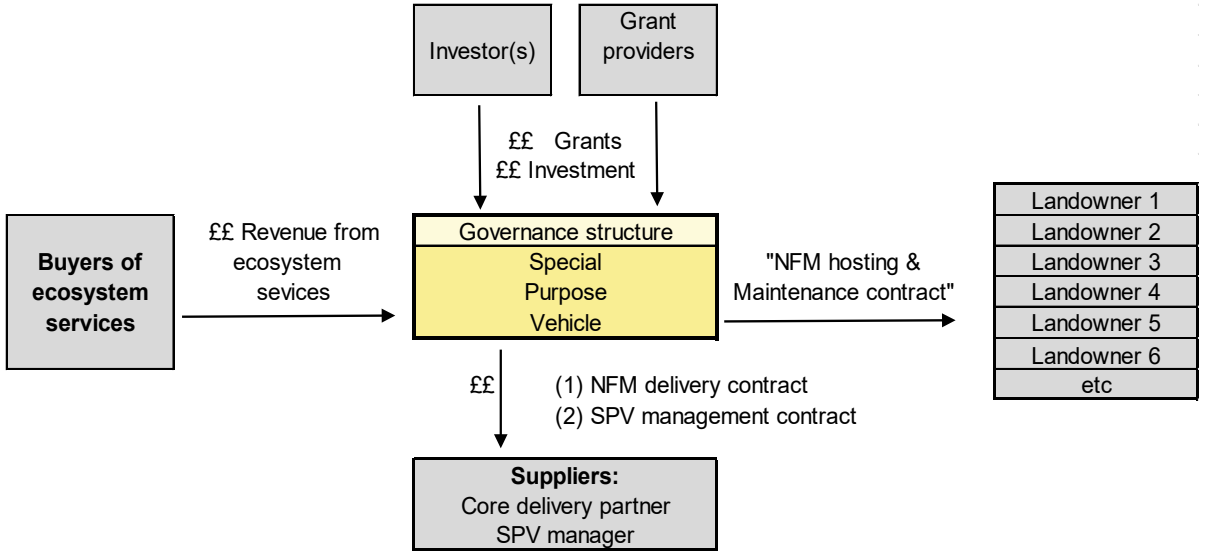
Department for Environment Food & Rural Affairs

Environment Agency

Wyre Flood Action Group

Wyre Catchment NFM project

Step 2 – Visualise the transaction structure



nature finance

Wyre Catchment NFM project

Step 3 – decide what the project is going to deliver

- A £1.5m natural flood management intervention in the upper River Wyre catchment in the Forest of Bowland, North Lancashire.
- NFM measures include leaky dams, wetland creation, peat restoration, new hedgerows and tree planting
- All designed to **store water, reduce peak flow, store carbon and increase biodiversity**
- Reduce flood risk to communities and businesses in lower catchment
- Create new long term revenue streams for landowners
- Using a commercial trading business model.

Hydrological modelling

- Predictive flood modelling undertaken by specialist consultancy
- Identified top 2% most effective interventions and locations.
- Aimed at reducing peak flow by 10% in a 1 in 50 year flood at Churchtown
- Hydrological model peer reviewed by academics
- Ground truthed

nature finance

Wyre Catchment NFM project

Step 4 – Make it happen! (Project start mid 2020)

Buyer discussions

Landowner discussions

Develop business plan and financial model, identify finance requirement

nature finance

Wyre Catchment NFM project

Project revenue stream = which ecosystem services

Ecosystem service	Potential revenue stream	Priority
NFM	**Yes - project will own and deliver this and can be supported by modelling**	**Very high**
Biodiversity	Belongs to landowner – no market yet	Low (but linked to interest rate)
Carbon	Belongs to landowner – has value for peat restoration or woodland creation	Low for project but good engagement tool
Water quality	Yes – but too difficult to measure/prove	Low – so ignore
Water storage	Yes - some potential if we can find a buyer	Medium - opportunistic

Conclusion – focus on NFM

- Model tells us we need £220,000 p.a. for 9 years
- Need to create an NFM buyer consortium to "share the cost"
- Other ecosystem services either a bonus for project or means of engaging landowners

nature finance

Wyre Catchment NFM project

Buyers (5 parties – UU, EA, RFCC, FloodRe and Wyre Council)

Contract terms

- Initial 9-year contract (extendable to 30 and 50 years at buyers' discretion)
- Annual index linked payment once NFM interventions are in the ground – so building up to full annual payment by end year 3.
- Performance KPI included – monitored immediately, effective start year 6

Attractions

- Part of a consortium – sharing the cost of flood risk mitigation with others.
- Transfer majority of construction and performance risks to investors.
- Performance KPI included – monitored immediately, effective start year 6
- Open book, structured by RT, delivered by a CIC, board representation available.

Concerns

- Largely addressed through contracting structures.
- How can we ensure we achieve our ROI through this

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Wyre Catchment NFM project

Landowners

Contract terms

- Initial 9-year contract (extendable to 30 and 50 years at buyers discretion)
- Annual index linked payment for hosting and maintenance of NFM interventions.
- Annual audit by Wyre RT to check the above.

Attractions

- Simple contract, annual payment, dealing with Wyre RT not Defra.
- Ability to fit NFM around farming and CS/HLS schemes.
- Delivered by a CIC, administered by Wyre RT, board representation on CIC

Concerns

- How will this private scheme interact with ELMS?
- How will this scheme interact with HLS roll over?
- What penalties if I want to step out after say 20 years?

nature finance

Wyre Catchment NFM project
Capital financing requirement

Grants

£600,000

- Tree planting
- Hedgerow creation

3 different woodland creation offers for landowners including a carbon offer

Repayable investment

£850,000

- Risk capital – unsecured
- 9 year loan
- Drawn down over 3 years
- Repayable over next 6 years

WOODLAND TRUST

Our priorities:
- Impact driven investors
- Competitive rates and terms

nature finance

Wyre Catchment project

Investors and investment terms

Two complimentary finance facilities bringing in 9 different investors:

	Institutional Loan Facility	SITR Loan Facility	For project Total
Number of investors	5 Funds	4 HNWs	9
Amount	£650,000	£200,000	£850,000
Term of loan	9 years	9 years	
Drawdown	Years 1 - 3	Day 1	
Headline interest rate	6%	6%	6%
Incentive interest rate	5%*	n/a	5% on part
Security	unsecured	unsecured	unsecured
Ranking	senior	junior	
Tax relief	no	yes - SITR	
Board representation	yes	no	yes

nature finance

Wyre Catchment project

Allocation of risks amongst stakeholders

	Buyers	Investors	Landowners	Rivers Trust(s)
NFM construction/delivery risk	£	£££	nil	reputational
NFM performance risk	££	££	nil	reputational
Contractual/counterparty risk	£	££		
External risks - policy/environmental	£	£		

Key

High
Medium
Low
Nil

Reasons for raising private investment – a) fund up front interventions and b) take on some of the risks

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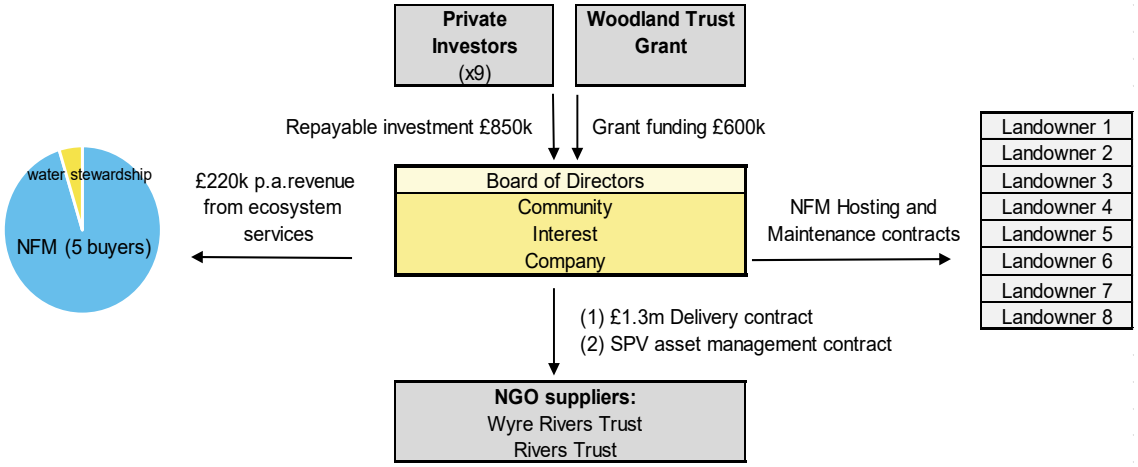
Wyre Catchment NFM project

Transaction structure on completion (March 2022)



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Wyre Catchment NFM project

Lessons learnt for future projects

Lessons learnt

- Trusted and knowledgeable intermediation is important
- Be flexible and resilient - need to identify barriers and overcome them one by one.
- Policy clarification from Government can be essential.
- Long term commitments are still problematic for landowners.
- An open book approach and a not-for-profit or community governance structure works well as helps mutual understanding, builds trust.
- Both buyers and landowners are likely to want to shape the business model.

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Wyre Catchment NFM project

A year on from financial completion of the project…

CIC Board comprises 7 directors representing: buyer group, landowners, local community, investors, Rivers Trust, Wyre Rivers Trust + an independent chair

- **Wyre CIC Board has met (virtually) 4 times since completion**
- **Wyre CIC has drawn down approx. 50% of the grant and investment funding**
- **Year 1 delivery on schedule – full work programme year 2**
- **Some upsides and downsides (inevitably)**
- **Site visit for all stakeholders planned for summer 2023**

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Wyre Catchment NFM project

First year on the ground delivery (photos Jan 23)

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Wyre Catchment NFM project

First year on the ground delivery (photos Jan 23)

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Wyre Catchment NFM project

First year on the ground delivery (photos Jan 23)

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Wyre Catchment NFM project

UK national award winner

Edie awards
31 March 2023

Nature and Biodiversity project of the year:
Wyre Catchment NFM project

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Wyre Catchment NFM project

A future template?

Yes – the learning and methodology here is scalable.

The Rivers Trust

is working on more projects like this

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Resilient Glenderamackin -

Nature Based Protection for People, Property & Wildlife

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Caring for our Lakes and Rivers

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The Rivers Trust

NATURAL COURSE

NATURAL ENVIRONMENT INVESTMENT READINESS FUND

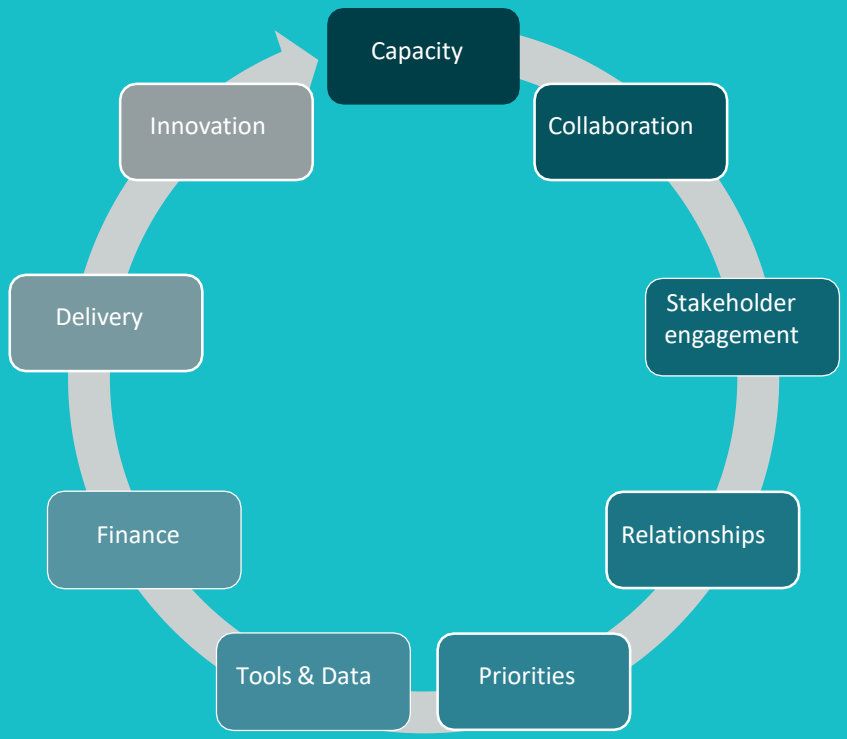
The Rivers Trust – What we do

Natural Course

Natural Course is building capacity to protect and improve our North West water environment now and for the future.

Objectives

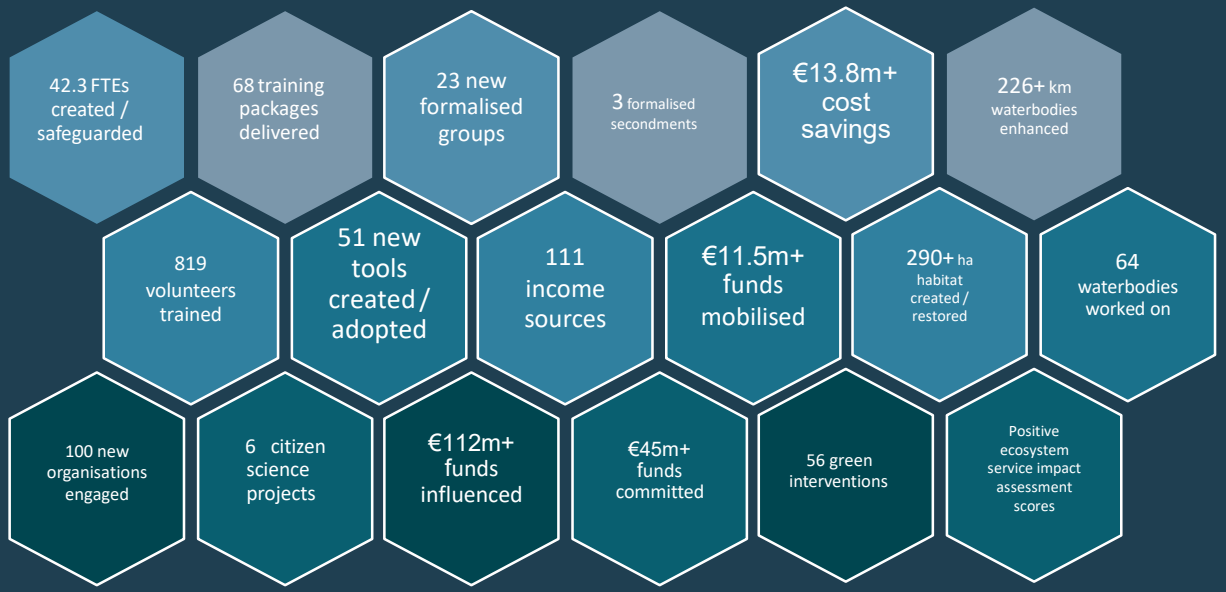
- Increase capacity
- Increase collaboration
- Increase engagement and formalise stakeholder roles
- Increase the use of third party data in RBMP
- Improve affordability
- Address root cause issues
- Upscale successes



Themes

Catchment Understanding
Water Governance
Natural Capital
Diffuse pollution
Natural Flood Management

Success in numbers



Natural Flood Management- timeline

2015

Storm Desmond

Record levels of rainfall caused devasting flooding resulting in 1/2 billion (£) of damage in the North West

Modelling and monitoring

Increase knowledge and capability in Modelling to help targeting. Monitoring built the evidence base

Delivery

Increase capacity to deliver interventions.

2022

How do we deliver at scale?

Mechanisms to finance the implementation of Natural Flood-risk Management (NFM) at scale in the UK, remains a significant barrier to uptake

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Caring for our Lakes and Rivers

The Issues

Flood Risk

Keswick has experienced a long history of flood with devastating floods occurring in 2005, 2009 and most recently in 2015, when over 515 properties were flooded.

Wider Issues

The catchment faces multiple threats including:

- Unfavourable-no change' SAC status (recently subject to nutrient neutrality regulations)
- Loss of biodiversity
- Poor water quality

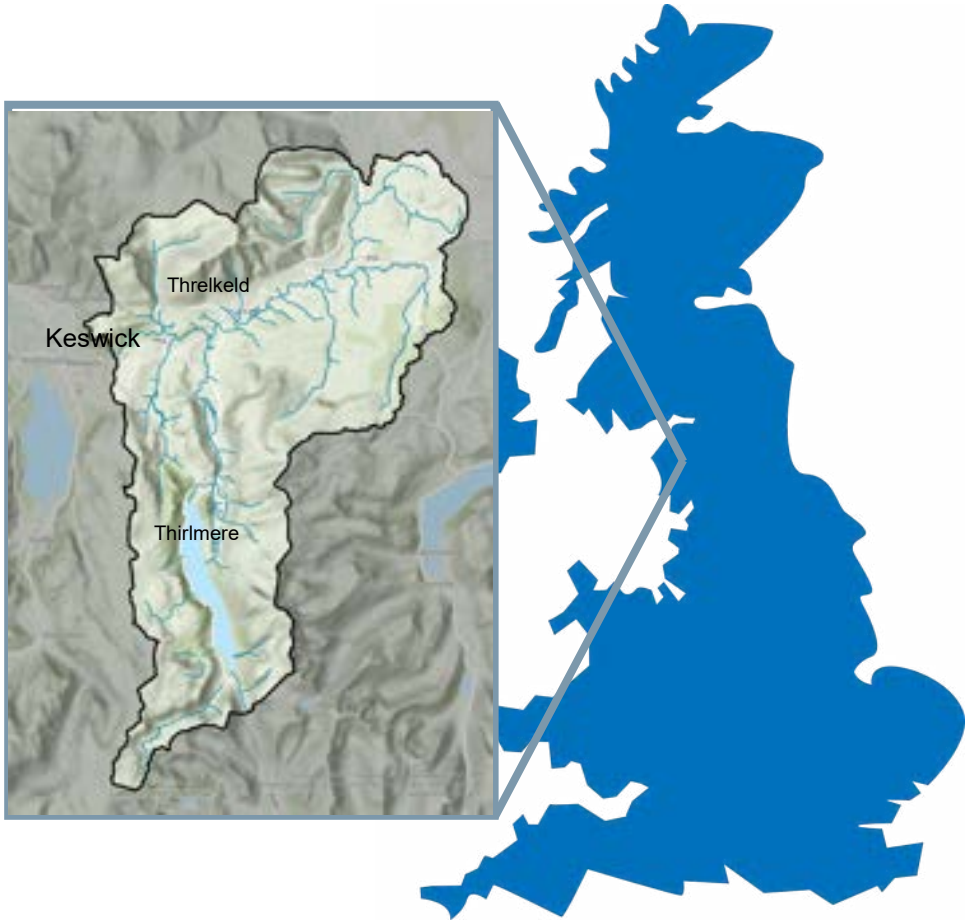
Glenderamackin Catchment- Planned interventions

The primary driver - NFM

- Developed through detailed hydrological modelling
- Targeted NFM to achieve a minimum **5% peak flow reduction in a 1 in 30 year flood event**
- **Reducing flood risk to at least 55 residential and 47 business properties**
- **142 km^2** catchment
- Located on ~**30** farms

Secondary drivers

- Improved water quality & quantity
- Carbon sequestration (soil, peat and trees)
- Habitat creation and biodiversity
- Socio-economic



Planned Interventions

Delivery to date

The Glenderamackin project launched in mid-2019- worked with **40+ farmers** and landowners

Real time monitoring demonstrating NFM interventions are working and effective.

Need to **scale up** – willingness within farming/land managing

Delivery to date:

- **414 leaky dams** and large woody debris features
- new **ponds** to permanently hold over **30,000m³**
- **Floodplain/pond storage** to temporarily hold back **35,000m³** during storm events
- **9.7 km of fencing** along becks and associated tree planting
- **9.9 km of hedgerow** planting and restoration
- 12 hectares of tree planting
- **enhanced 22km** of river


Series of storage ponds


Earth bund


Catchment tree planting

What we want to do

Headline

Reduce peak flow by **5% in a 1-in-30 year flood**.

(Formal flood defences protect Keswick to a 1 in 25 year standard)

What will be delivered?

Based on detailed hydrological modelling delivery of highly targeted **NFM interventions** which will store **900,000m3** in the upper catchment

Other benefits

Interventions will **increase biodiversity,** store **carbon** and **improve water quality** creating a resilient catchment

How?

Develop an innovative blended finance mechanism in line with 25YEP, attracting **£8 mil** of private investment and enter into **long term contracts** with farmers and landowners.

Hedge planting

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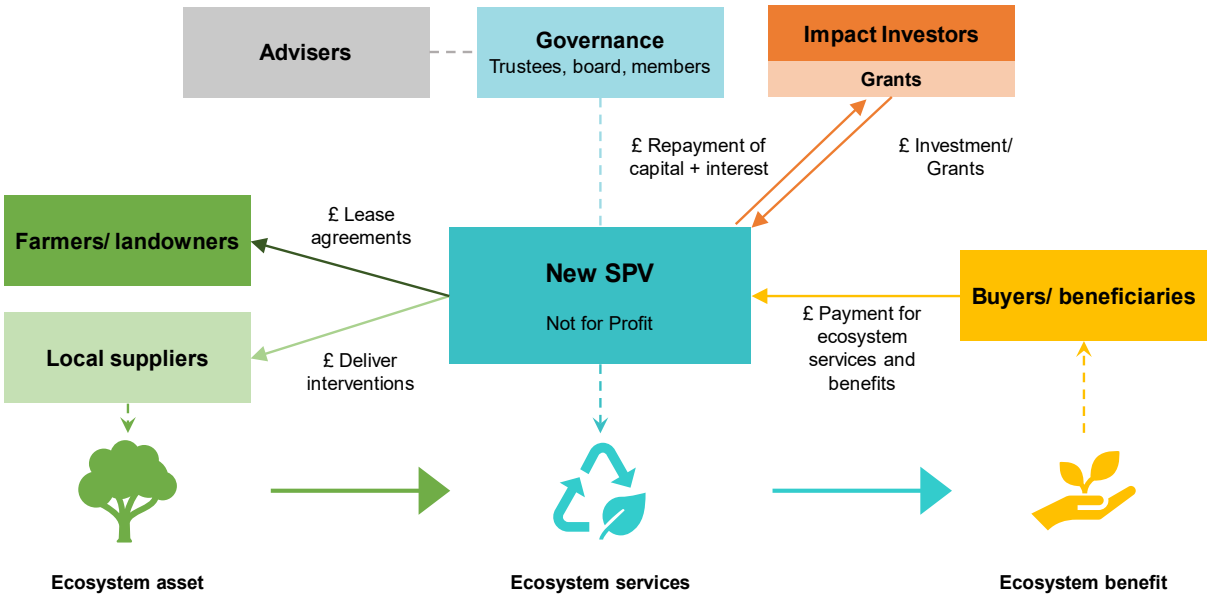
NATURAL COURSE

NATURAL ENVIRONMENT INVESTMENT READINESS FUND

Proposed transaction structure



Notes:

- Upfront capital investment from green finance
- Repaid over time by buyers of ecosystem services
- Long-term agreements with land managers
- Establish SPV as contracting / financing vehicle for project
- SPV independent – not for profit. CIC likely.

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Headline finance structure and buyer proposition

Structure

Project delivered through a CIC

CAPEX requirement - £8m

Implementation period – 5 years

Investment structure modelled:

- £7m loan to SPV at 7% p.a.
- Drawn down years 1 to 5
- Repaid years 6 to 12

OPEX (excl loan interest)

- £300k (years 1 to 5)
- £200k thereafter

Buyer Group

- Potentially; UU, EA, Highways, Local & National corporates, FloodRe
- 12-year initial contract with CIC
- Extendable to 25 years
- Project requires an average of c.**£1m of revenue p.a**. over 12 years
- Use of external up-front investment can transfer delivery risk to investors.

Potential discussion points:

- Performance metric
- Reduce external debt – increase annual payments and shorten contract

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Ecosystem services

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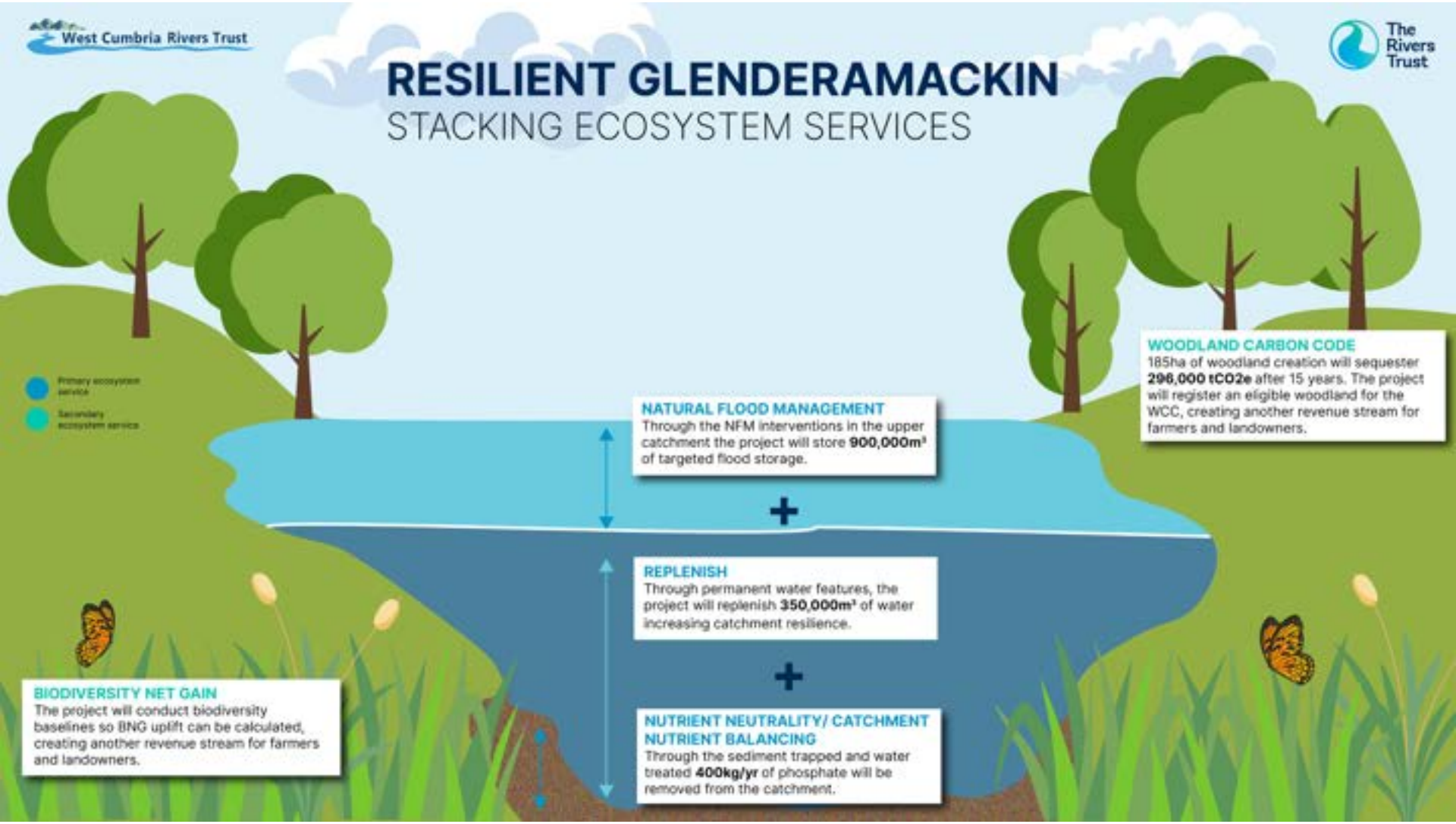
NATURAL COURSE
OUR WATER OUR FUTURE

NATURAL ENVIRONMENT INVESTMENT READINESS FUND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The Rivers Trust
RESILIENT GLENDERAMACKIN
STACKING ECOSYSTEM SERVICES
Primary ecosystem service
Secondary ecosystem service
NATURAL FLOOD MANAGEMENT
Through the NFM interventions in the upper catchment the project will store 900,000m³ of targeted flood storage.
WOODLAND CARBON CODE
185ha of woodland creation will sequester 296,000 tCO2e after 15 years. The project will register an eligible woodland for the WCC, creating another revenue stream for farmers and landowners.
REPLENISH
Through permanent water features, the project will replenish 350,000m³ of water increasing catchment resilience.
BIODIVERSITY NET GAIN
The project will conduct biodiversity baselines so BNG uplift can be calculated, creating another revenue stream for farmers and landowners.
NUTRIENT NEUTRALITY/ CATCHMENT NUTRIENT BALANCING
Through the sediment trapped and water treated 400kg/yr of phosphate will be removed from the catchment.

Nutrient mitigation opportunities

Nutrient Neutrality

Nutrient Neutrality requires a zero net increase in nutrient levels from new plans or projects within the catchments of sites protected under the Habitats Regulations 2017:

- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- Ramsar sites

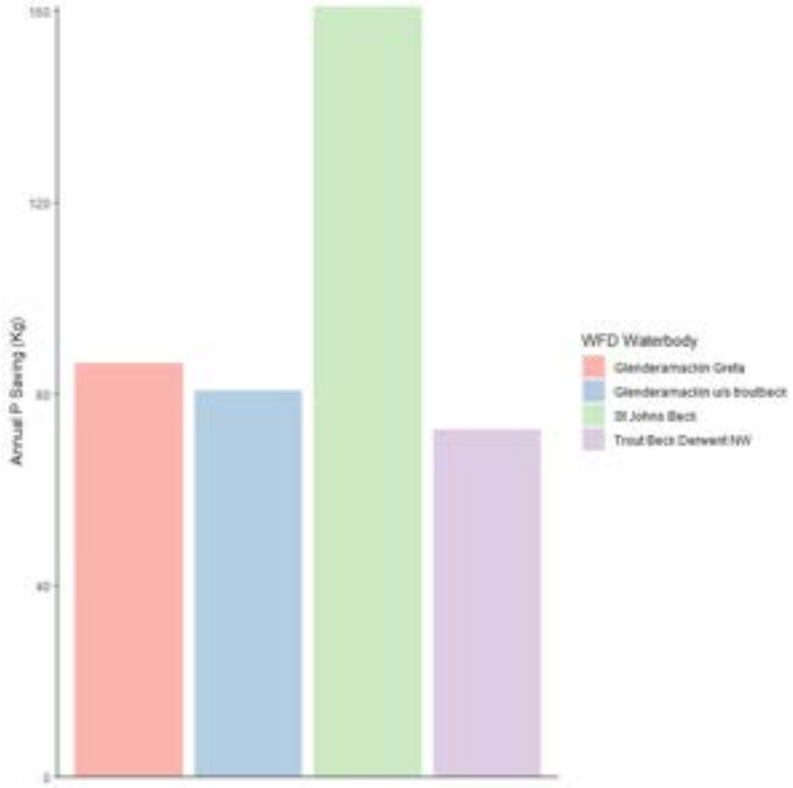
Each catchment has a 'Nutrient Budget Calculator' used to calculate the excess nutrient load from a development. This must be mitigated either onsite (SuDS) or offsite (NbS)

Catchment Nutrient Balancing

CNB is a water sector initiative to engage with farmers to deliver catchment-based solutions; reducing nutrient loads to help achieve water quality objectives.

CNB quantification of the benefits

- Using the ‘fair share’ principle 17 interventions were agreed with the Environment Agency
- Farmscoper analysis at a farm and catchment scale identify opportunities and quantify reductions
- Water industry can use different models (SAGIS-Simcat) and is important to consider data exchange
- Monte Carlo approach to account for uncertainty in the Farmscoper outputs



Replenish : Volumetric Water Benefit Accounting

- *"A method for implementing and valuing water stewardship activities "*

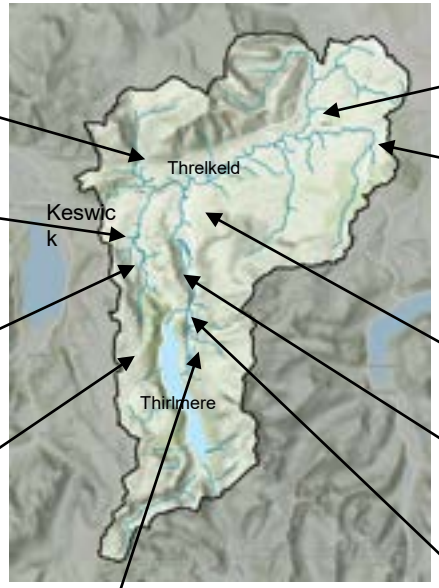
- "WRI and partners at Quantis, LimnoTech and Valuing Nature have developed a new approach for implementing and valuing water stewardship activities.

- VWBA empowers companies with a comprehensive, standardized and science-based methodology to calculate and valuate the benefits of water stewardship activities. This new method enables businesses and other key stakeholders to better tackle shared water risks at catchment-scale"

- Volumetric Water Benefit Accounting (VWBA): A Method For Implementing and Valuing Water Stewardship Activities | World Resources Institute (wri.org)

Resilient Glenderamackin: Nature based protection for people, property & wildlife

Anticipated project outputs



3.125km bunds
Storing ~100,000m³ water

Earth bunds

45ha
Storing ~315,000m³ water

Ponds/wetlands/scrapes

x200
Storing ~4,000m³ water

Leaky dams/large woody debris

7km
Storing ~1,750m³ water

Cross slope hedge creation

10km
Storing ~2,700m³ water

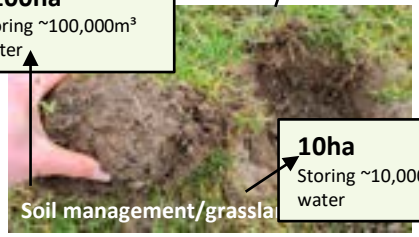
Buffer strips

2km – 3.5km
Storing ~33,000m³ water

River restoration/floodplain reconnection

30ha
Storing ~150,000m³ water

Re-wetting peat



2100ha
Storing ~100,000m³ water

10ha
Storing ~10,000m³ water

Soil management/grassla

3.125km
Storing ~100,000m³ water

Bunded hedgerows (with swale)

185ha
Storing ~158,760m³ water

Tree planting

Next Steps

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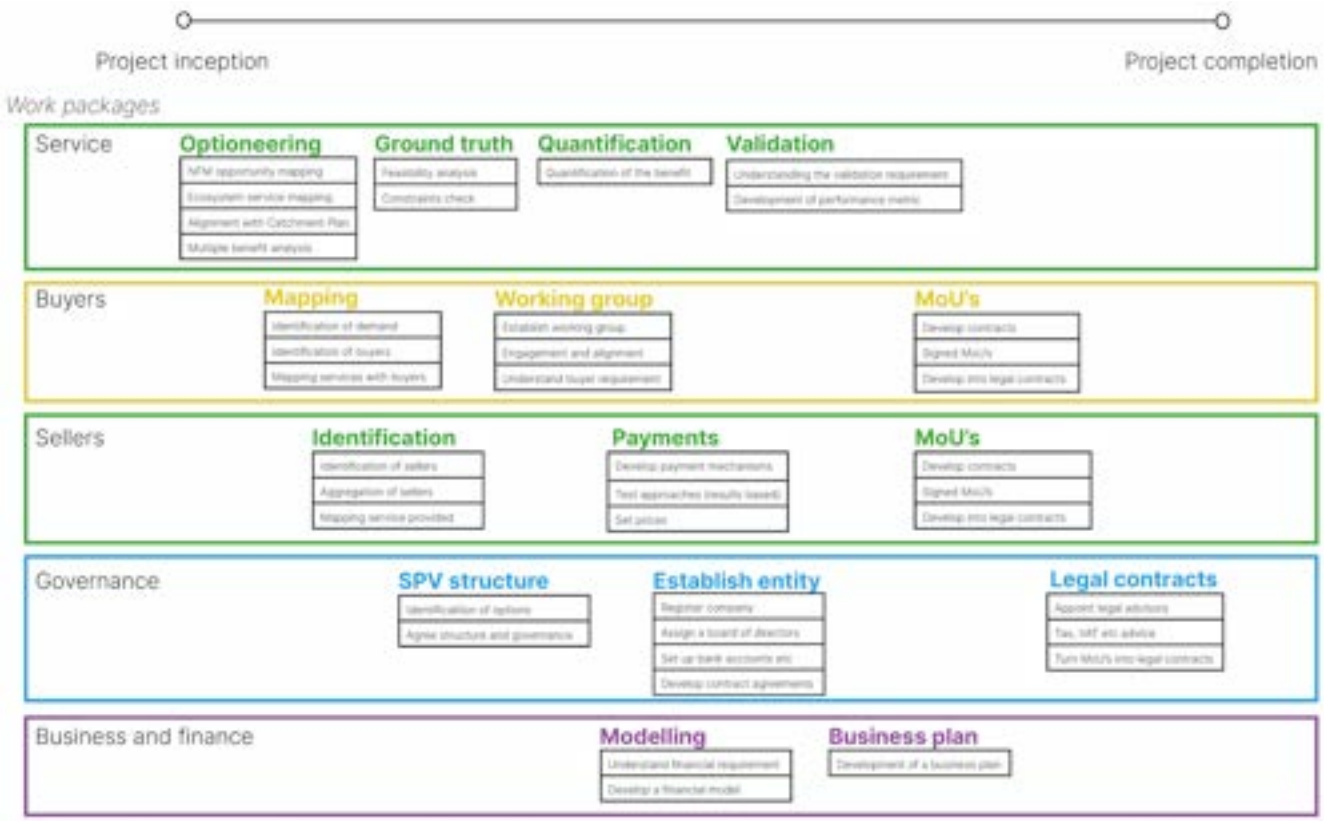
Process development



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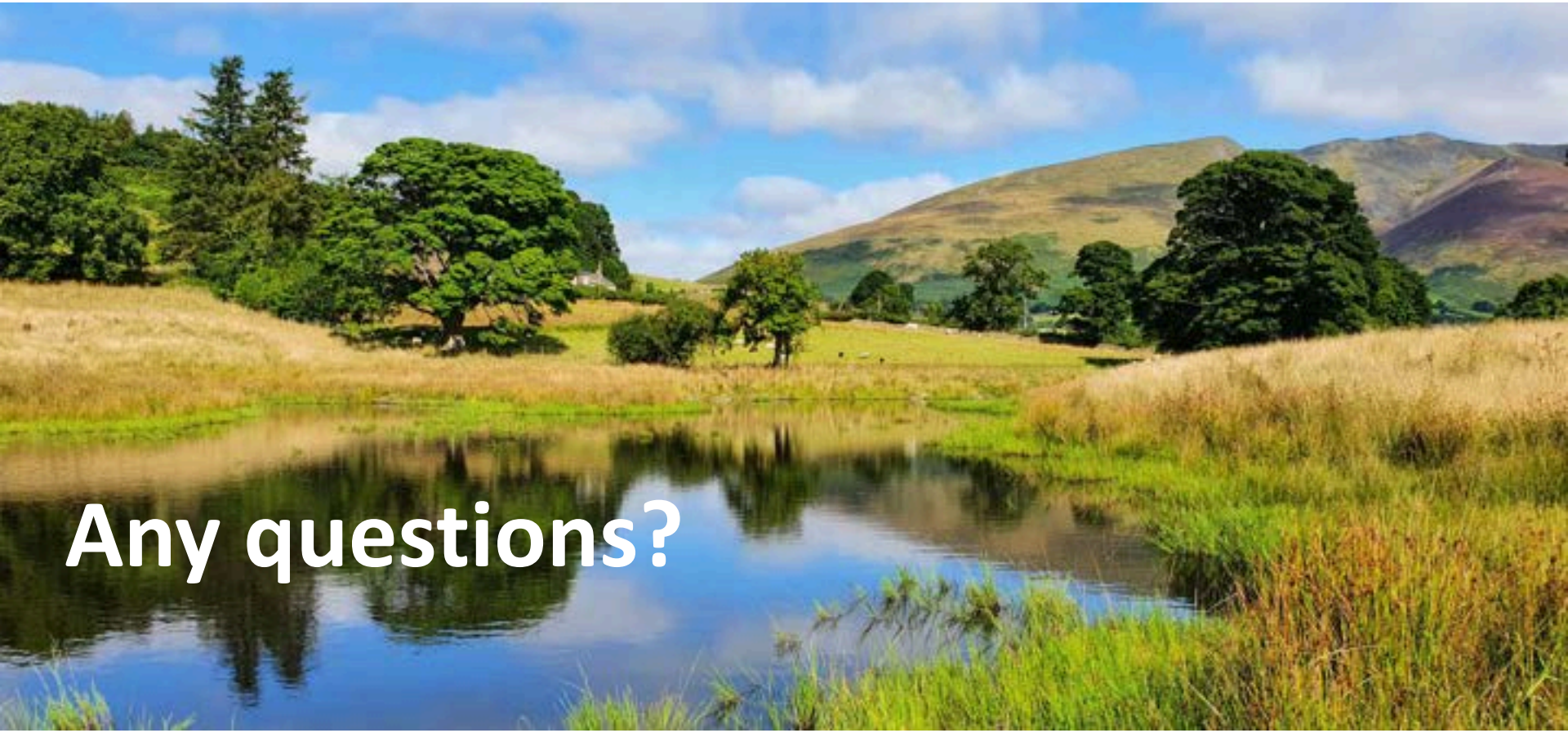

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NATURAL COURSE

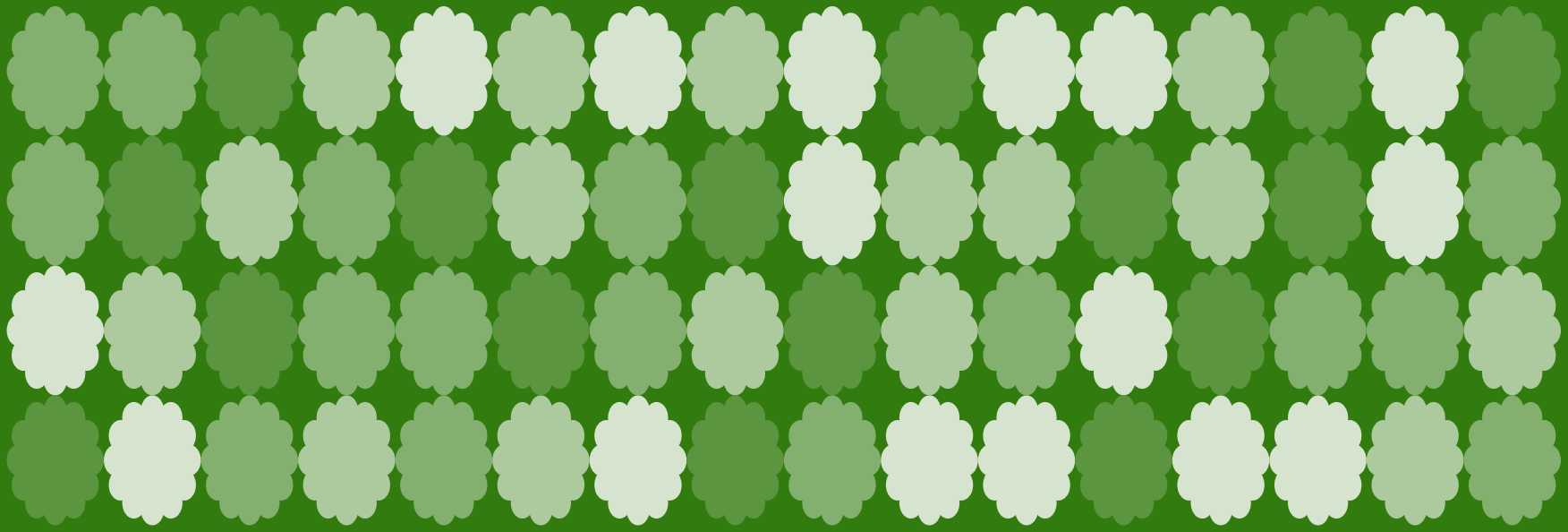
NATURAL ENVIRONMENT INVESTMENT READINESS FUND

NATURAL COURSE
OUR WATER. OUR FUTURE

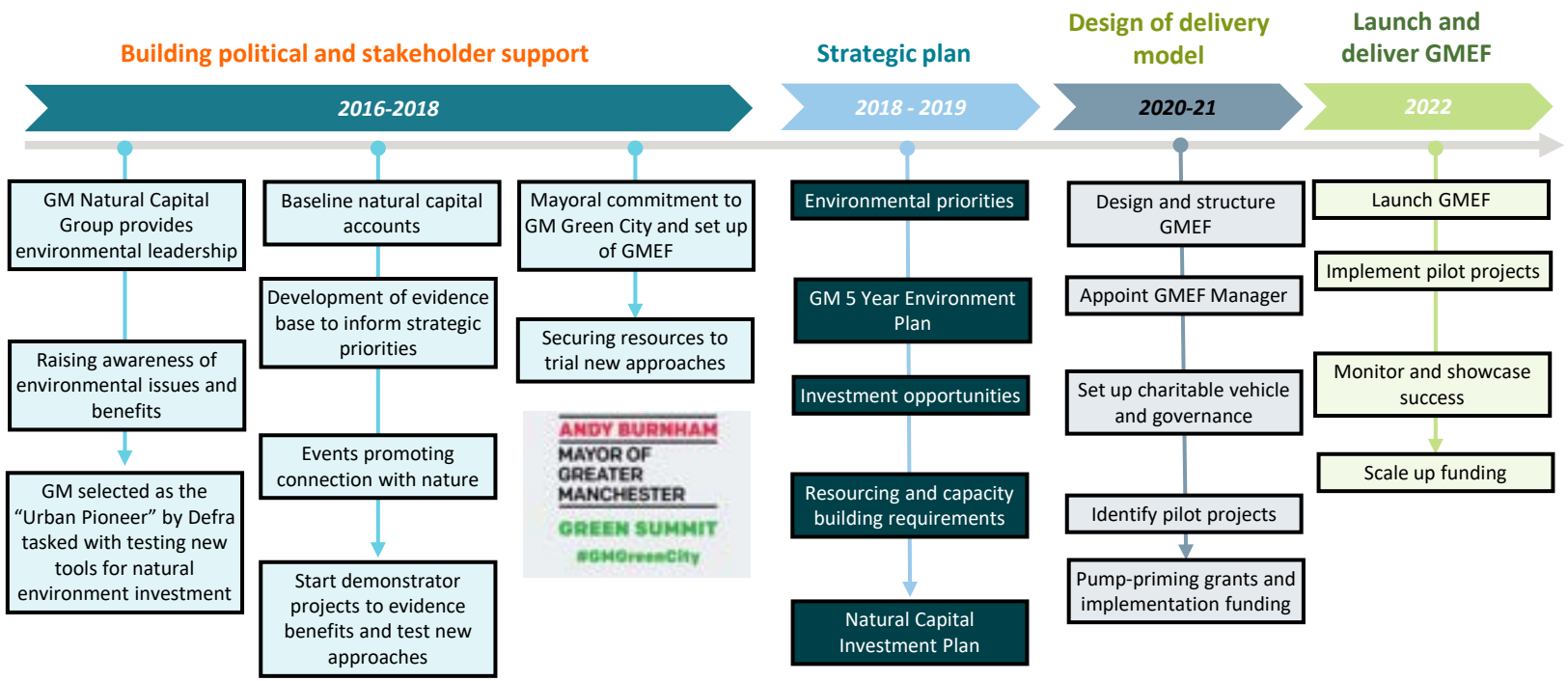
Life

GREATER MANCHESTER
DOING THINGS DIFFERENTLY FOR THE ENVIRONMENT

The Greater Manchester Environment Fund and Biodiversity Net Gain



Our Natural Capital Journey



To build a structure of this scale, pump priming grants are required to bring in much needed development capacity to launch GMEF, implement pilot projects and showcase the benefits that GMEF has to offer.

Valuing our Natural Environment

£1bn - total annual benefit

£9bn – total value of avoided healthcare costs (over 60 yrs)

- Preventing **370** hospital admissions, avoiding **1,200** life year's lost
- Approx. **44,000** buildings receive noise mitigation
- **135,000** people meet their physical activity guidelines, giving over **4,600** QALYs

Natural Capital Investment Plan

The investment plan aims to support the agreed vision of:

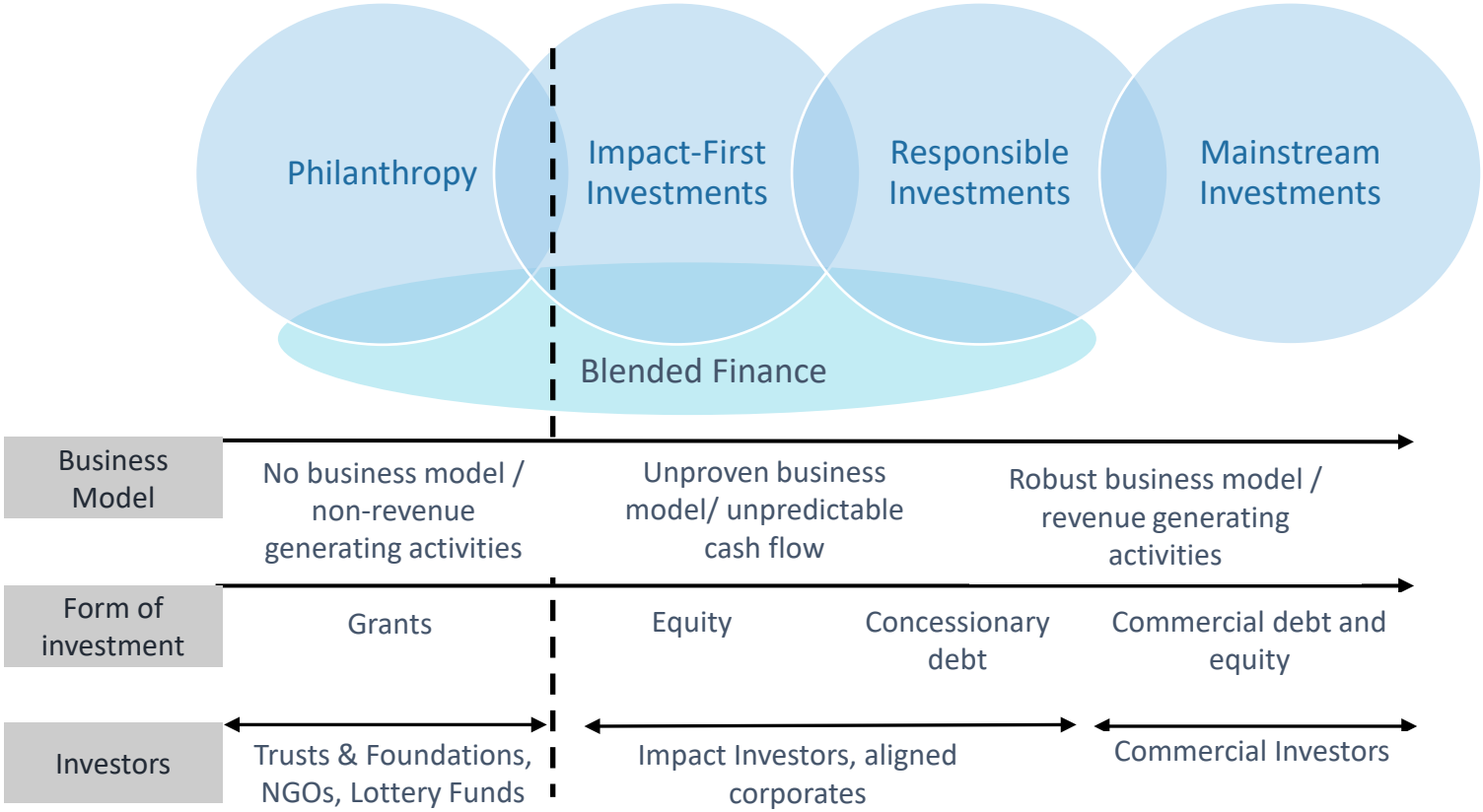
> ***"A Greater Manchester where investments in natural capital enhance the long-term social, environmental, and economic health and wellbeing of its people and businesses."***

Investment in natural capital defined as:

> "**Funding that is intended to provide a return to the investor while also resulting in a positive impact on natural capital."**

- Returns are defined predominantly, although not exclusively, in financial terms.
- Public and third sectors still have an important role to play, as enablers and innovators.

Sources of capital



GMEF Funding Opportunities Horizon

Liaison with a broad range of GM stakeholders and a dedicated GMEF Advisory Group has evidenced the significant opportunity for GMEF to raise public, philanthropic and private funds to deliver a thriving natural environment in GM and become self-sustaining over the long-term.

Short Term (1-3 year)		*Medium Term (3-5 years)**		*Long Term (5+ years)**	
Pump-priming public and philanthropic grants	To provide much-needed development capacity and to pilot approaches	**Landfill funds**	Surplus landfill funds	**Sustainable Drainage Scheme ("SuDS") fund**	Private investment mechanisms for SuDS are in development through the EU-funded IGNITION programme
Corporate funding programmes	Deliver corporate programmes – **£200k committed from Suez Community Fund**	**Enforcement undertakings**	Fines for pollution issued by the EA	**Environmental Impact Bonds**	Results-based payment models are being explored to finance NBS
Habitat Bank Facility	Further detail provided	**Corporate sponsorship and individual giving**	Long-term corporate partnerships and individual giving based on GMEF showcasing success	**Built environment carbon fund**	GM is considering a mandatory carbon offsetting approach to delivering net zero carbon development
Carbon Mitigation Facility		**Plastic bag / waste levies; business levies**	Levies through retail partnerships and / or Business Improvement District initiatives	**Low-carbon / circular economy**	Incorporate investment funds to achieve wider low carbon ambitions

Within 5 years, GMEF aims to accumulate sufficient funding, levies and private investment to become a self-sustaining funding source to support the delivery of GM's environmental ambitions.

**Funding opportunities are indicative based on market analysis and stakeholder engagement. Other funding opportunities may also be available.*

GREATER MANCHESTER
DOING THINGS DIFFERENTLY FOR THE ENVIRONMENT
Lancashire, Manchester & N Merseyside
Environmental Finance

Grant funding projects – Green Recovery Challenge Fund

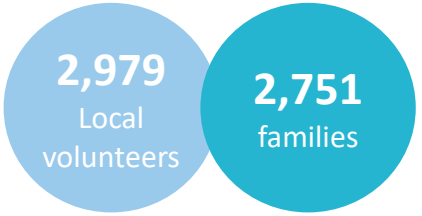
GMEF has formed a partnership with GM-based NGOs to support the delivery of the pilot GM Local Nature Recovery Strategy through a portfolio of collaborative projects that will demonstrate how activity can help both nature and people recover from Covid-19. Funding requested = £1,823,016

Shovel-ready project portfolio

GMEF and partners aim to deliver a portfolio of 10 'quick win', collaborative projects in every Borough of GM, to help realise GM's Local Nature Recovery Strategy through:

- **Delivering 537ha of habitat restoration, across 42 sites, benefitting 2,758ha of connected landscapes:**
  - 48ha wetland and lowland peat in GM Wetlands NIA, a constantly threatened pinch point between GM and Liverpool.
  - 117ha upland peat at Dovestone in Oldham
  - 58ha floating island habitat along GM canals
  - 59ha riparian habitats along GM river corridors
  - 255ha existing woodlands in Bury, Oldham and Trafford
- **Delivering nature-based solutions to address the climate emergency**
  - 446ha natural flood management projects across 5 boroughs
  - 155ha peatland restoration to transform areas into carbon stores

Connecting people with nature



Job creation and volunteering opportunities

Grant Funding - Green Spaces Fund

Purpose
We will create a new 'Green Spaces Fund' to give small grants to communities to clean up and improve pocket parks and local green spaces or create new ones where they are needed.

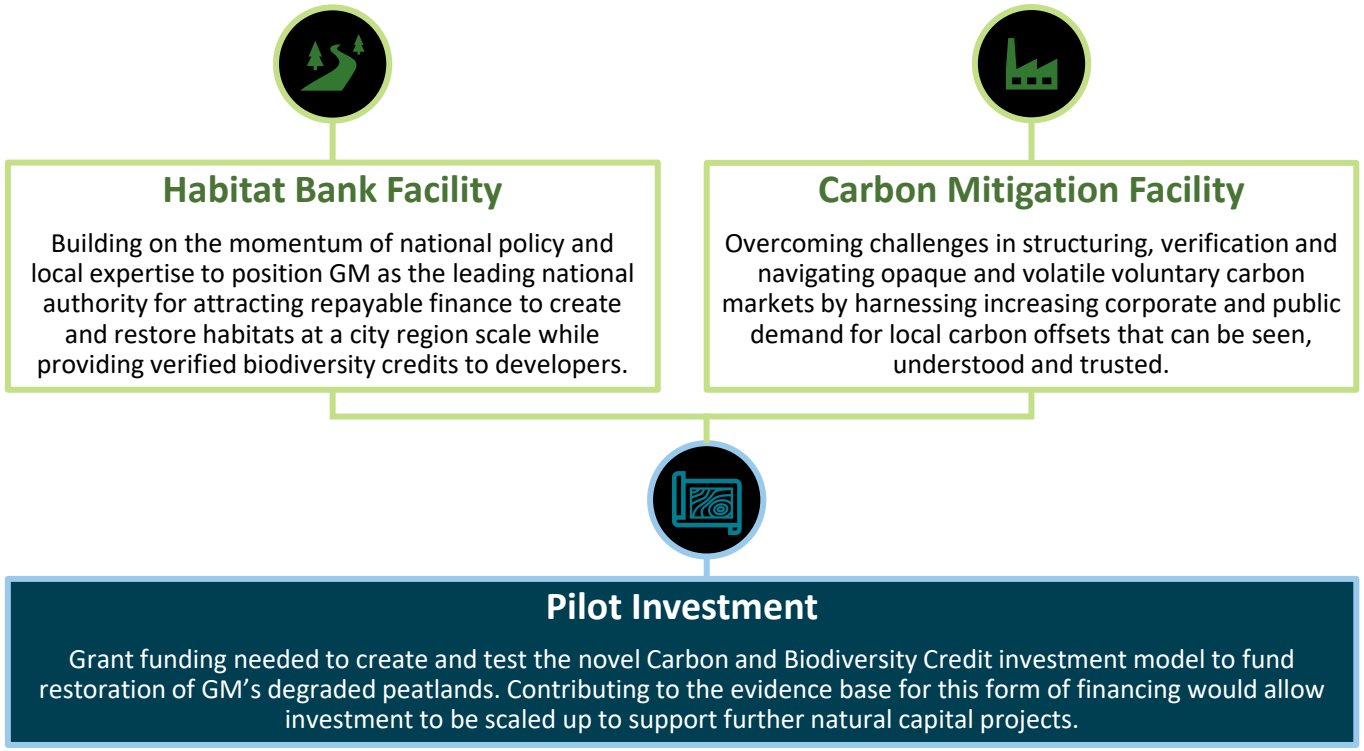
[We will] increase the amount and quality of accessible nature-rich green space, particularly for our poorest residents."

Round 1 Proposals:

- **Over 70 projects proposed from across Greater Manchester – 21 awarded funding.**
- **A range of small (<£10k) and large (<£40k) proposals submitted.**
- **A range of organisations and project types.**

Investment Opportunity Deep Dives

Two key investment models have been identified as the initial focus of GMEF, with the need to deliver a proof of concept pilot investment to support model scale up.



Part of a set of tools aimed at reversing the decline in biodiversity across England.

- Net gain is an approach to development that aims to leave the natural environment in a measurably better state than it was beforehand.
- Nature recovery is about stepping beyond conservation into active restoration of the natural world and halting the decline in species abundance by 2030.

Background and Policy Context

Lawton Report 'Make Space for Nature' (2010) - '*Bigger, Better, More Joined up*'

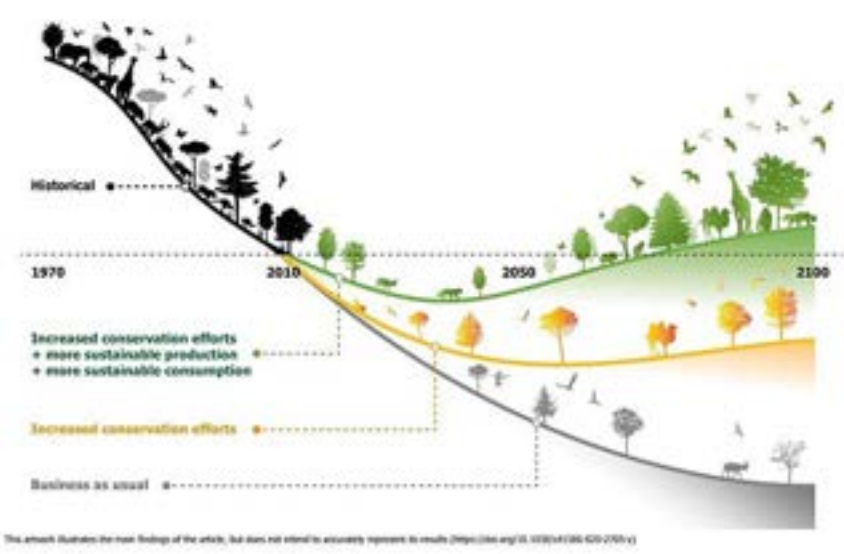
25 Year Environment Plan (2018) -

'*Be the first generation to leave the environment in a better state than we found it'. Develop a Nature Recovery Network*

Agriculture Act (2020) – *public money for public goods*

Environment Act (2021) – *species and habitat targets, mandatory 10% BNG for developments*

30 by 30 Pledge (2020) – *protect 30% of land/sea by 2030*



The government committed to making BNG mandatory through the Environment Act.

All planning permissions granted in England (with a few exemptions) will have to deliver at least 10% biodiversity net gain from Nov 2023

Environment Act 2021

CHAPTER 30

Key components of mandatory BNG

- **Minimum 10% gain required calculated using** Defra provided Biodiversity metric & approval of a biodiversity gain plan

- **Habitat secured at least 30 years** via obligations/ conservation covenants
- Delivered via habitat enhancement on-site, off-site

- **National register** for net gain delivery sites

- Does **not change existing legal protections** for important habitats and wildlife species

- **Maintains mitigation hierarchy** of avoid, mitigate, compensate

Progress to date

Funded largely via the Natural Course Programme and the Defra funded Natural Environment Investment Readiness Funding (NEIRF)

- Raising awareness via an officer network
- Upskilling - BNG training for 50 officers
- GM Guidance - GM BNG Guidance (2021)
- Planning for roll out:
  - Implementation plan for offsite BNG
  - Agree joint processes and prepare for delivery
  - Set up of the Greater Manchester Environment Fund a number of purposes but also as a potential vehicle to help Local Authorities to deliver offsite BNG on LA-owned sites.

2023 - Preparatory work

GMCA and GM Ecology Unit have been undertaking a programme of support to the districts to help readiness for mandatory Biodiversity Net Gain (BNG) in November 2023.

For 2023 this programme is focusing on 3 key priorities:

1. Finalising the processes and governance arrangements between Developers, Districts and GMEU for assessing and making decisions on planning applications with BNG
2. GMEU preparing, and being properly resourced, to act as the local regulator for BNG
3. Ensuring local sites are coming forward to act as supply sites for offsite BNG

Delivering BNG On and Off-site

Onsite (units)

Delivered via habitat creation/enhancement via landscaping/green infrastructure

Offsite (units)

Potentially in full or combination

Delivered through new habitat creation/enhancement on land holdings or via habitat banks

Statutory Credits

Only if units not available

Delivered through landscape-scale strategic habitat creation delivering nature-based solutions

Delivery of offsite BNG

- Delivery of Offsite BNG presents an opportunity for funding nature recovery in GM – of about £5-6m per year from BNG offsetting.
- An England-wide open market for BNG offsetting is starting to develop now.
- Developers will be able to choose where and with whom to offset.
- LAs will be able to set out (in the LNRS, plans and policies) where priorities for offsetting are, which will weight biodiversity units created in those areas more favourably.
- But LAs will not be able to mandate or direct where offsets should take place.
- We are therefore looking to develop a local market – to avoid developers purchasing offsite units elsewhere, outside GM or nationally, and keep the benefits within local areas and GM.
- We need districts across GM to consider bringing forward LA-owned sites for offsite BNG

Ensuring local sites are coming forward to act as supply sites for offsite BNG

- Forecasting demand for offsite BNG from future development in GM, how this could be met on LA land and any shortfall/oversupply.
    - *GMEU - Needs and Supply Assessment (Natural Course funded)*
- Ensure local authority understand the steps and options for how to site could be taken forward to meet this demand.
    - *GMEF - NEIRF projects and workshops (Defra funded)*

GM BNG Needs and Supply Assessment

Objectives

Developing a clear understanding of future demand for offsite biodiversity units is essential to inform the introduction of mandatory net gain across GM, and plan for the resources required. The objectives of this study were to:

- Model the expected size of the potential market for offsite BNG in Greater Manchester over the next 15 years (from 2022)
- Identify the potential of LA-owned offsite supply sites in Greater Manchester which could help meet this demand for each district

Need

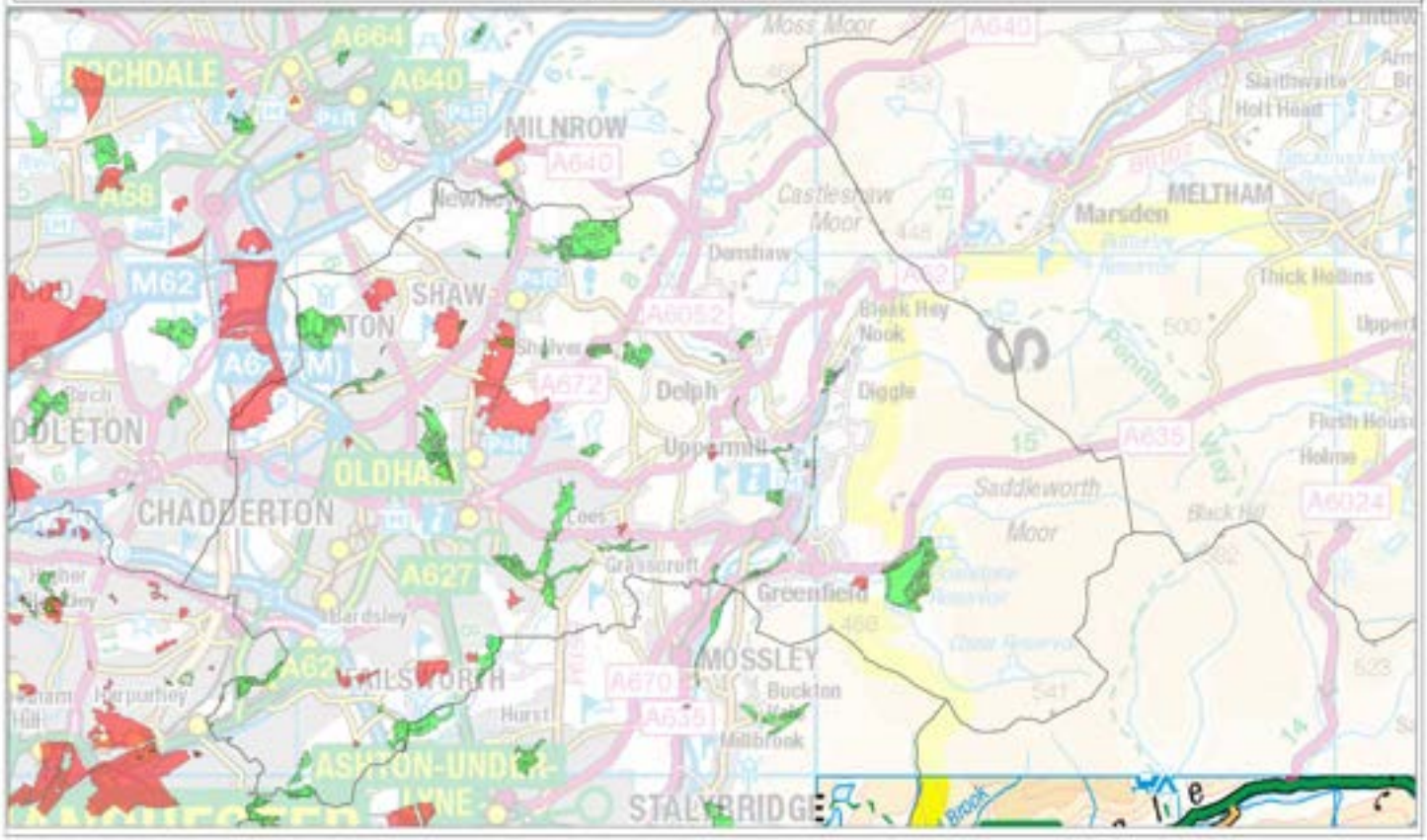
- Identification of future development sites and areas
- Shortlisting sites based on their likelihood to require offsite BNG
- Assessing likely habitat and unit loss

Supply

- Working with district officers to identify LA owned sites which could be candidates for offsite BNG
- Districts were asked to provide sites meeting key priority criteria
- Desk based estimation of potential uplift (gain) in biodiversity unit value

POTENTIAL BIODIVERSITY NET GAINSITES & ALLOCATIONS

Greater Manchester Ecology Unit



S:\BNG Need and Supply Study 2021-22\BURY

Date: 30/01/2023

Results

- Demand varies across each of the districts, with the greatest demand for units predicted for Trafford, Rochdale and Manchester and the lowest demand in Bury, Salford and Oldham.
- Estimated demand of between £87- £65 million allocated to biodiversity net gain over 15 years, £4.3-5.8 million per annum over 15 years.
- Across Greater Manchester **337 potential offsite BNG supply sites** were put forward by districts, **covering a total area of 5,314 hectares.**
- In total, across GM, these potential offsite BNG supply sites could deliver an estimated 13,456 biodiversity units.
- Based on initial ground truthing testing exercises undertaken by GMEU – its is likely that around 1/3rd of the area of the sites will be viable as offsite BNG sites.
- Based on 1/3rd of the site area coming forward, the supply sites could bring forward around 4,484 units, and uplift over 1700 hectare of land for biodiversity.
- Potential market value of these units of £89.6-£67.2 million based on different unit prices.

Key next steps

- The needs and supply assessment provide a clear indication of likely future demands and a strong evidence base to bring forward sites to meet local demand
- Communicated the results to 9 of the 10 districts in Jan/Feb 2023
- Working with the GMEF to help district to bring forward sites for the local BNG market
- Set up of a Local BNG Offset Site Directory, hosted by GMEU, to promote sites

Building a Biodiversity Net Gain market for Greater Manchester

ENT FUND

BRINGING SUPPLY SITES FORWARD AND INTO DELIVERY AGREEMENTS

Identification	Preparation and Development	Securement	Registration and sale of units	Delivery
Sites identified according to agreed criteria (e.g. Through the GMEU Need and Supply Assessment)	• Baseline survey • Uplift assessment • Draft [costed] Habitat Management and Monitoring Plan (HMMP) • Unit cost calculation	• Landowner agreement committing to 30 year term • Payment plan • Agreed HMMP	• Site registered • Site verified • Sale of units • Negotiation with developers • Legal agreements	• Commencement of habitat works • Delivery of HMMP • Ongoing maintenance, management and monitoring

Districts can deliver these requirements in a number of ways - complete all services using district staff, commissions, eNGOs to deliver service (or parts of) for the preparation and or delivery work commitments i.e. monitoring, capital restoration and ongoing maintenance

LEARNING FROM DIFFERENT PHASES

Example of work in Manchester:

8.4ha site (grassland and woodland)

Habitat baseline assessment – 65 units

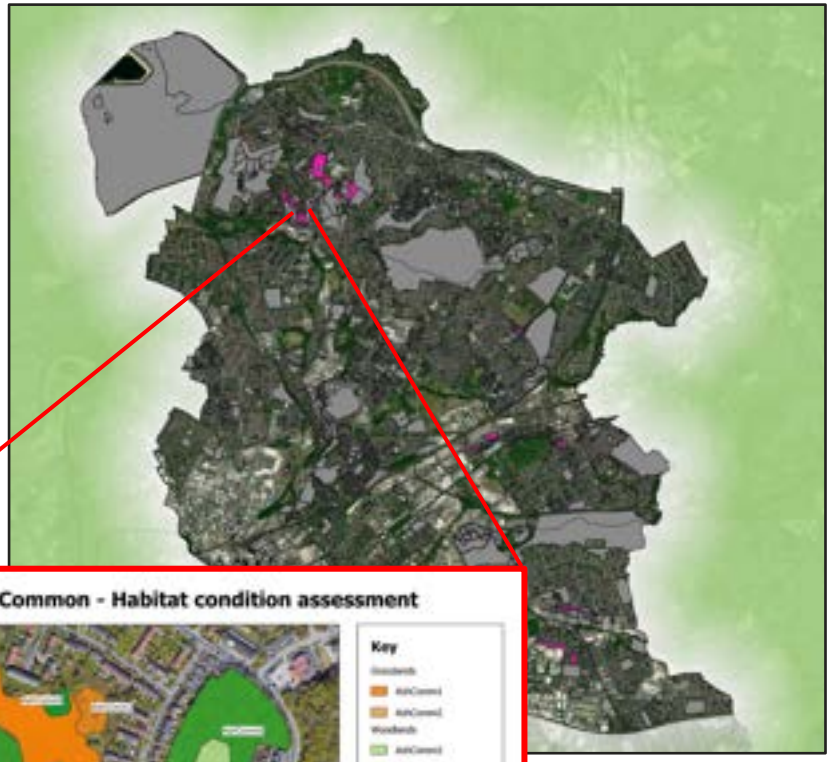
Habitat enhancement assessment – 21.24 unit uplift

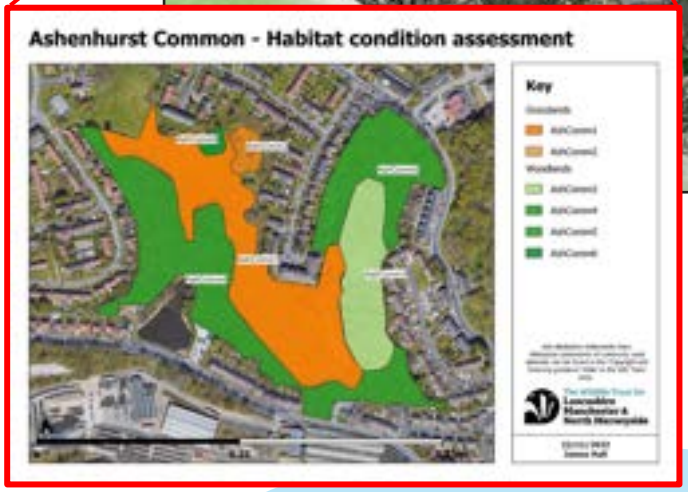
30 year plan

3 years active restoration

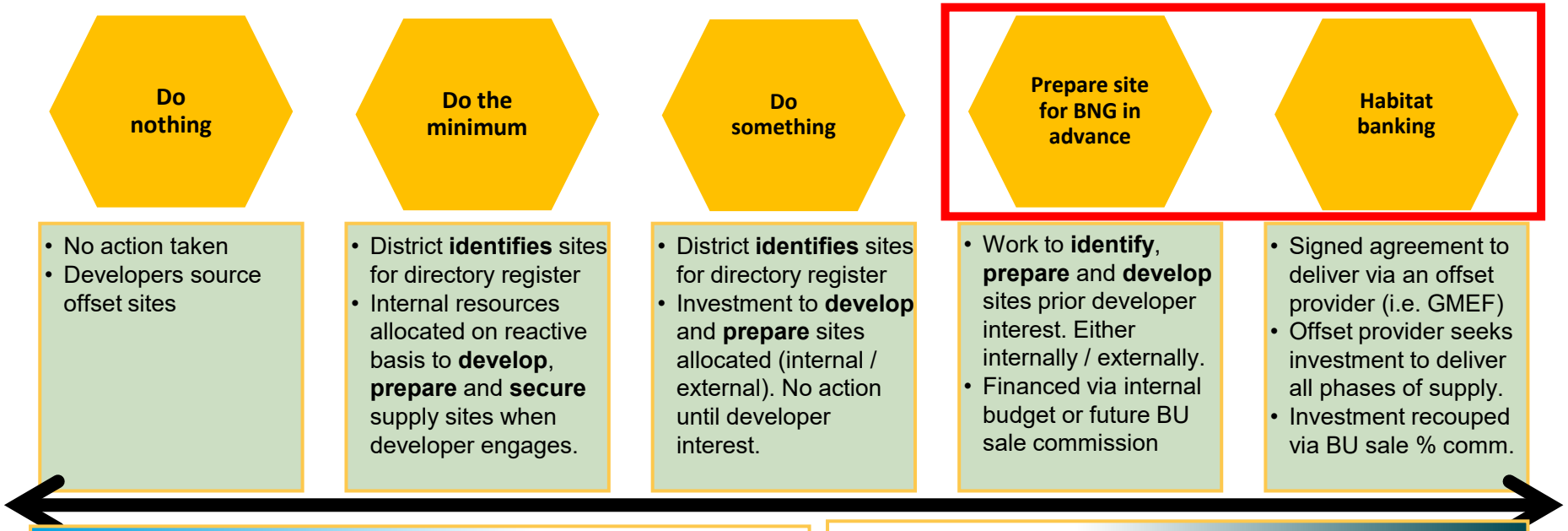
27 years maintenance to ensure habitats restored / unit uplift achieved

Costed





POTENTIAL OPTIONS WHICH DISTRICTS MAY CHOOSE TO TAKE FORWARD BNG



- Developers secure supply site(s) outside district / GM
- Investment and increases in quantity / quality of natural environment leaves district / GM
- Reactive approach increases risk of long-term liabilities for district
- Impact upon officers responding reactively to developers

- Larger pool of prepared investment opportunities secures finance and grows market in GM
- Long-term liability risk to district low
- District's priority sites more likely to secure investment / improvements
- Low impact upon district officers capacity

- Economy of scale around technical, admin and legal

Key next steps

- Ensuring we are not missing opportunities for local delivery of offsets
- Encouraging every district to consider bringing forward local supply sites
- Overcoming challenges and barriers
  - Lack of resources and capacity
  - Legally securing sites for 30 years
  - Access to expertise
- Promote local-authority owned sites for BNG via the Local BNG Offsite Directory

IGNITION: Building Business Cases for Urban Nature-Based Solutions

the ignition PROJECT

NATURE-BASED SOLUTIONS TO THE CLIMATE EMERGENCY

GREATER MANCHESTER
DOING THINGS DIFFERENTLY

UIA

European Union
European Regional Development Fund

A UIA funded innovation project to research and develop a local perspective on:

How do we increase the retrofit of Nature Based Solutions in our city-region, in the right places? And how do we pay for them?

the ignition PROJECT
NATURE-BASED SOLUTIONS TO THE CLIMATE EMERGENCY

Context - Climate Risk

A combination of climate change and development in Greater Manchester has led to increased risk of flooding and has resulted in surface water flooding incidents increasing six-fold since the 1940s

The number of heat stress incidents in Greater Manchester are becoming more frequent, particularly affecting vulnerable citizens

Climate change projections highlight that winter precipitation could increase by 30-50% across Greater Manchester by 2050, and peak summer temperatures are predicted to rise by 6 degrees.

Climate Adaptation

Nature-based solutions can provide **resilience** to climate risks:

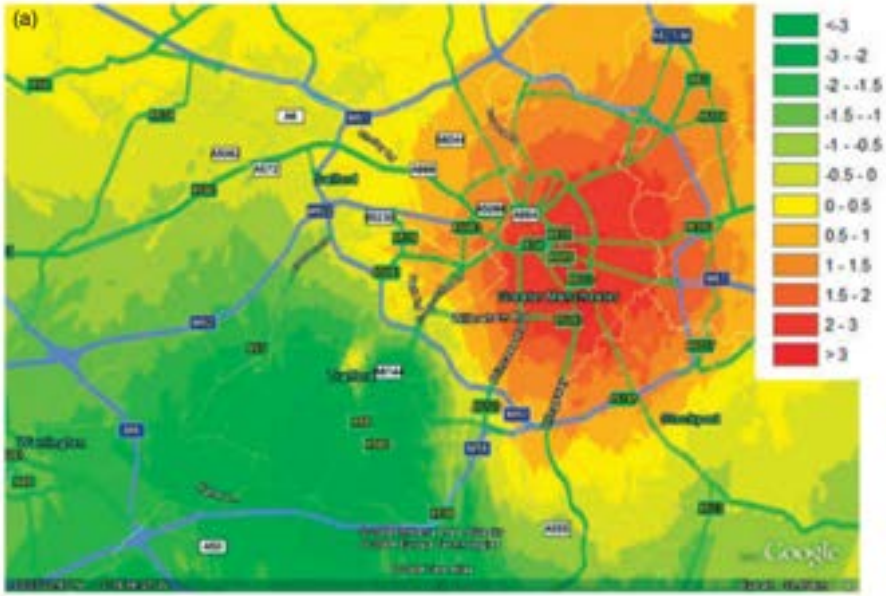
- Surface-water flooding
- Urban Heat Island Effect
- Individual stress and resilience

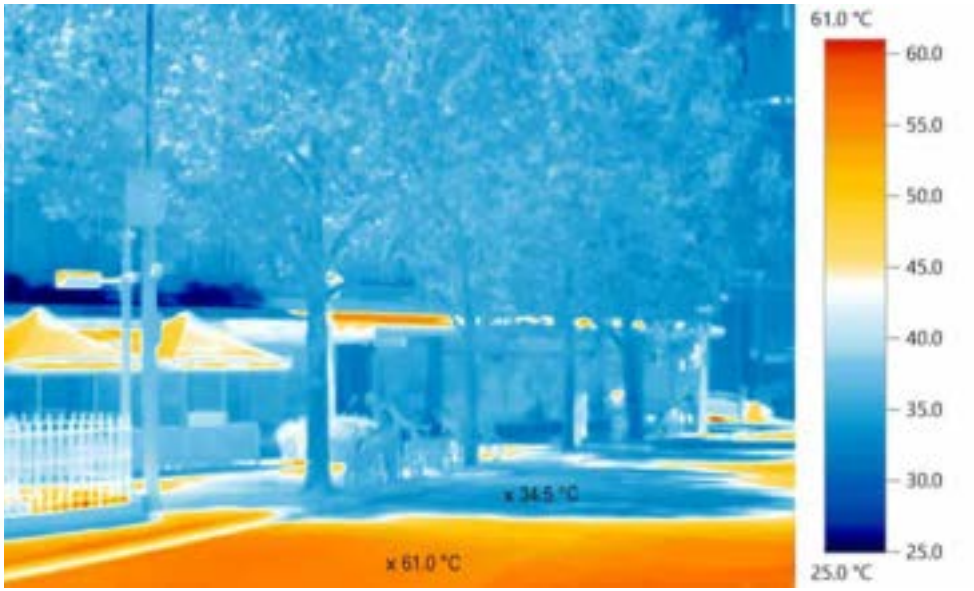
Managing water quantity

Ealing, London – Pre and Post SuDS installation

Image courtesy of London Borough of Ealing, GLA SuDS Guide

Combating the urban heat island effect





Greater Manchester Urban Heat Island

Image courtesy of Knight et al. (2010) Mapping Manchester Urban Heat Island.
Image courtesy of the Guardian

Adaptation finance gap

- £354m finance gap in UK for natural flood management.
- Wider £56bn gap in funding nature ambitions.
- Lack of dedicated public finance.

IGNITION

Build investor confidence in nature based solutions

Explore new business models and funding mechanisms

Create pipelines of projects across the City Region

Building investor confidence

Nature Based Solutions: Evidence bases

1000+ Evidence Items

Across 5 Urban Nature-based Solutions databases

Measuring 12 benefits

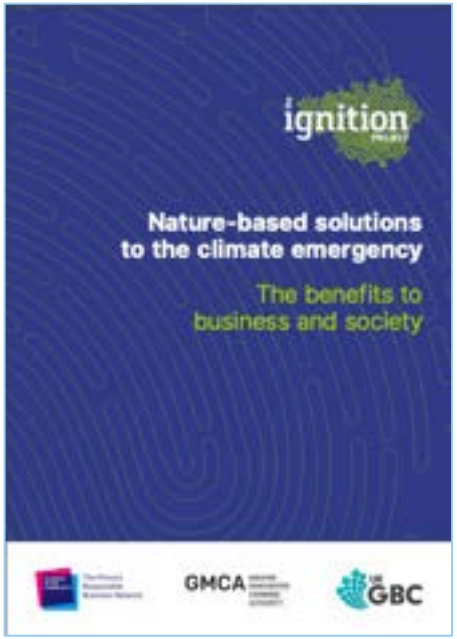
Open access evidence bases on the natural capital benefits of Nature based solutions

- SuDS
- Street trees
- Green walls
- Green roofs
- Green spaces

The databases contain the entirety of the raw data in a simple, easy to use excel format

Promoting natural capital benefits and approaches

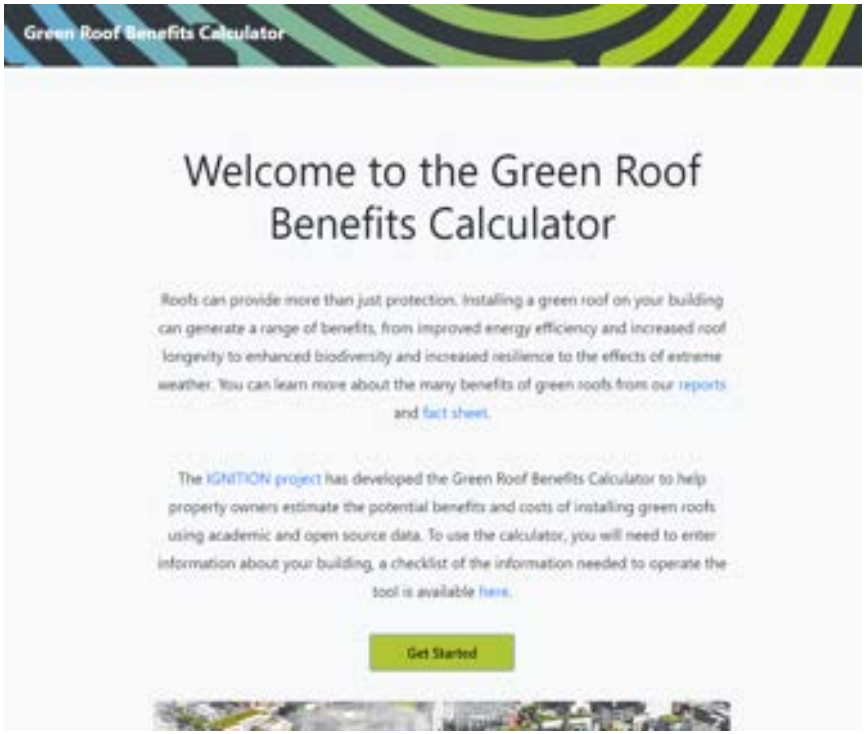
Nature-based solutions to the climate emergency: Benefits to business and society

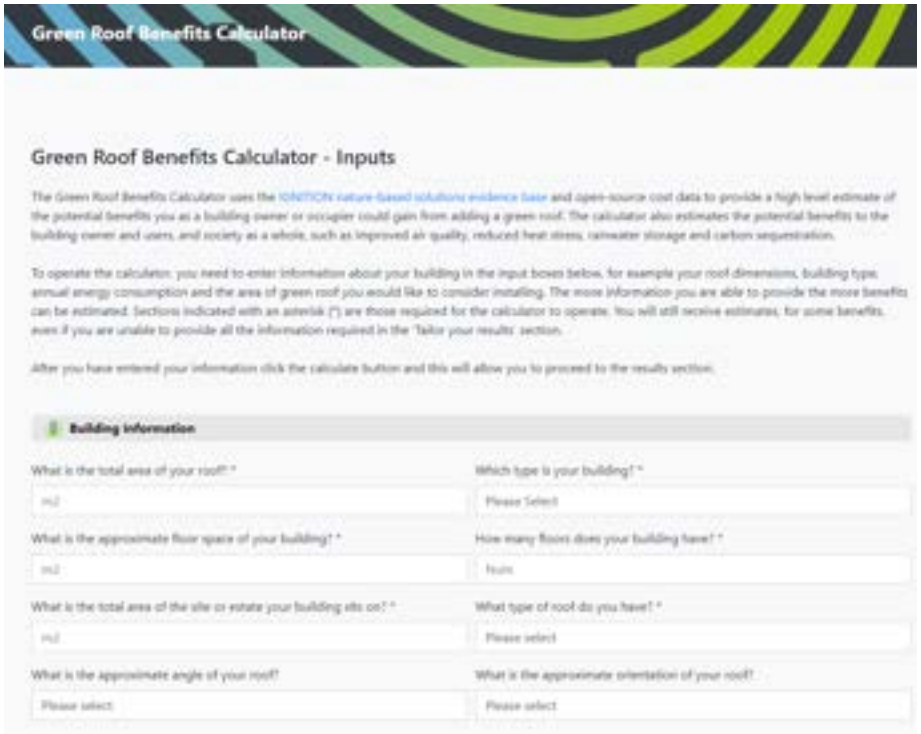


Seeing is believing: Inspiring change

https://ignitiondashboard.salford.ac.uk/

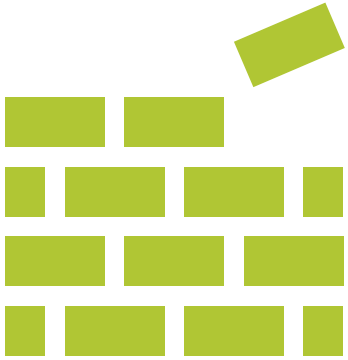
Enabling business to engage with benefits data





Enabling providers to showcase value

Impact



- Highlight opportunities for partnership investment in NBS
- Identifies gaps in evidence
- Calculate benefits at scale
- Support installation proposals, business cases and funding bids
- Calculate the impact on specific communities/audiences
- Communications and engagement
- Inspiring change / seeing is believing
- Provide evidence for sustainability commitments

Building Business Cases


Public parks
SuDS including rain gardens, swales and trees
Business case Parks foundation
Non-domestic properties
SuDS such as rain gardens and swales
Business case Co-investment in areas of flood risk & annual savings on waste water charges
Commercial premises
Green roofs and walls
Business case Invest to save
Streets & alleys
Street trees and community green planting
Business case
Green regeneration
New developments
SuDS including rain gardens, swales, trees, ponds and wetlands
Business case
Parks Improvement Districts
KEY
Preventing flooding and droughts
Improving air quality
Reducing urban heat island effect
Restoring biodiversity
Providing insulation and reducing energy consumption
Capturing and storing carbon
Encouraging local economic growth
Improved amenity
Improving health and wellbeing
Improving land and property value
Highways
Non-domestic property owners
Businesses
Community groups
Developers
Investors
Local authorities
Local lead flood authorities
Planners
Policy makers
Property maintenance companies
Property managers and owners
Water companies
Water quality
Schools

Building business cases for SuDS

Swales and basins

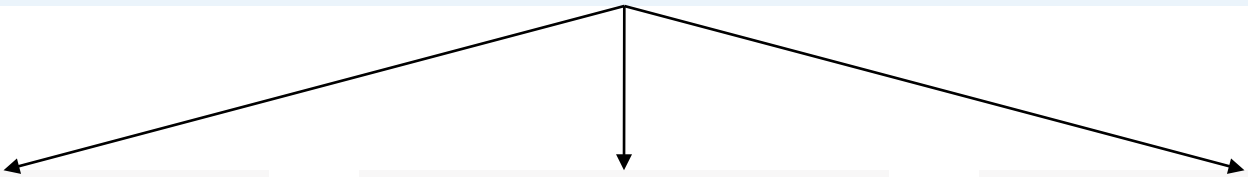
Raingardens

Tree pits and planters

Porous paving

Overview – Collaborative Approaches to SuDS

Understand how can we collaboratively develop business cases for urban SuDS using a natural capital approach



Explore value proposition from SuDS for different operational investors and beneficiaries.

Establish strategic locations of interest for co-investment.

Test the approach through a case study.

Who benefits from SuDS?

- Rainwater runoff storage
- Improved water quality
- Safer public spaces
- Improved health and wellbeing
- Increased footfall and improved aesthetics
- Increased property value

- Local Authority – LLFA
- Local businesses
- Local Authority – Highways
- Water company
- Environment Agency
- GMCA/ LAs
- Public Health / NHS
- Residents

Who has demand for these benefits and also the ability to pay?

Beneficiary engagement: Who has demand for these benefits?

Highways and regeneration

Lead Local Flood Authorities & Environment Agency

Local businesses, residents, NHS

Water Company

Department for Communities and Local Government

Department for Environment Food & Rural Affairs

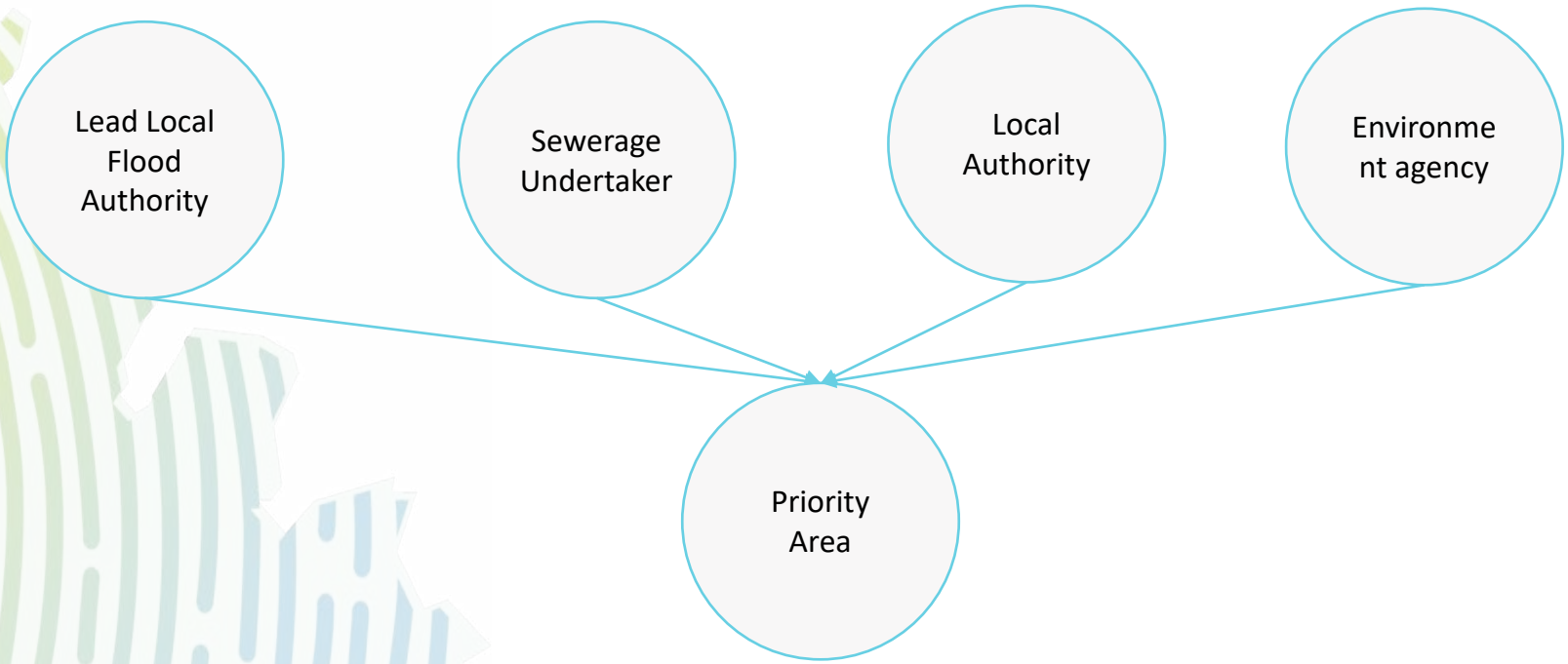
MANCHESTER BID

England's Northern Forest

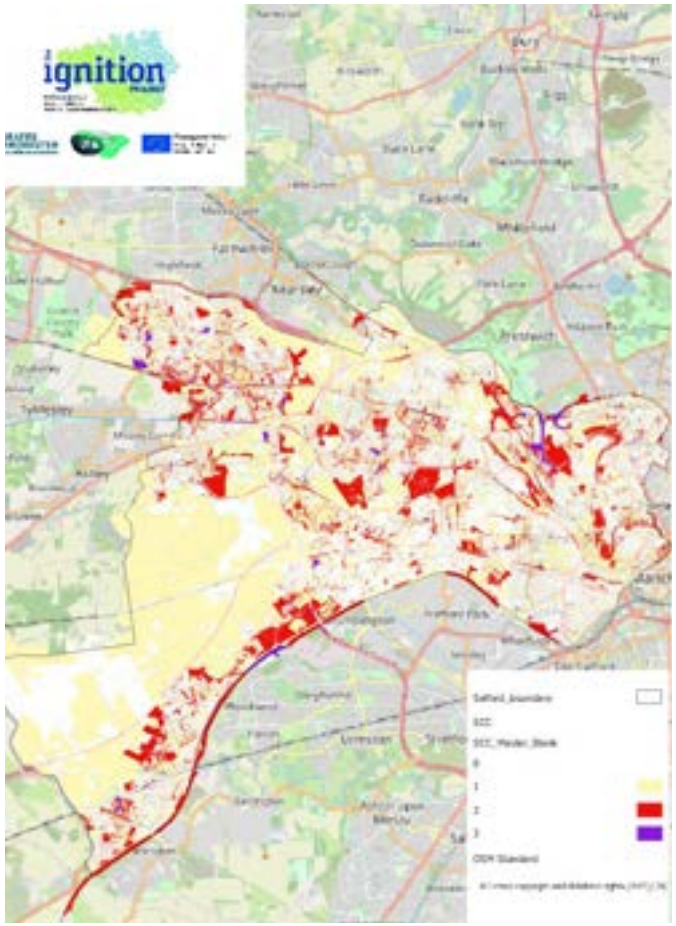
North West Regional Flood & Coastal Committee

United Utilities
Water for the North West

Establish locations of interested for co-investment



Establish strategic locations for co-investment



Little Hulton

Walkden

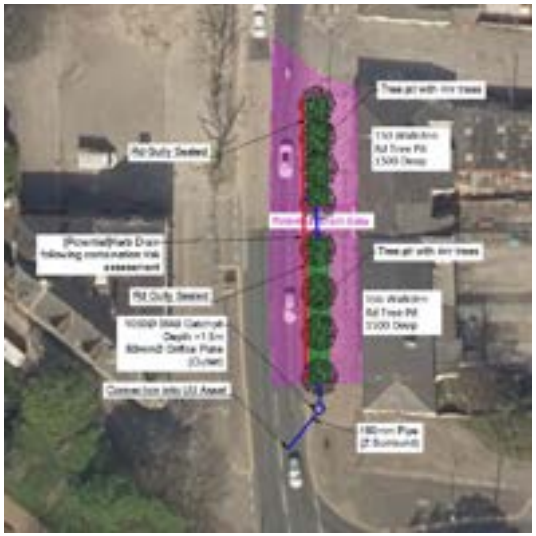
Swinton Park and Swinton town centre

South Worsley and Monton

Identify potential interventions

Longlisted Options

Shortlisted Options



Outline designs

Estimate benefits– Water Management Benefits

51% reduction in internal sewer flood risk for a 1-year event

2.1km of pipes show an improved sewer capacity

2% reduction in peak flow rate at combined sewers*

5% reduction in internal sewer flood risk for a 30-year event

0.1km of pipes show an improved risk of flooding

3% reduction in flow volume at combined sewers*

*5-year 1 hour storm

Amenity: £2.1m

Recreation: £2.9m

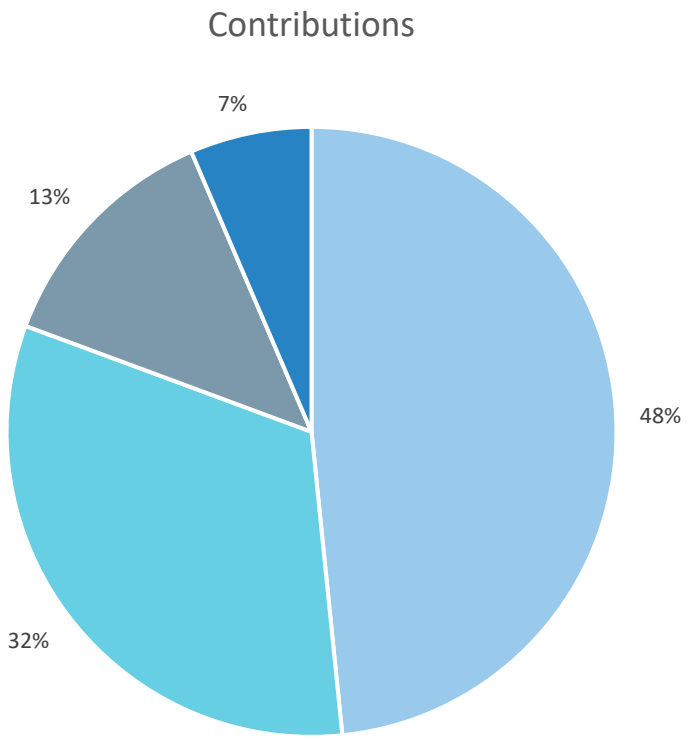
Air Quality: £15.9k

Carbon: £3.0k

Health: £3.2k

Total: £5.4m

- Engage beneficiaries and help value benefits
- Understand a fair contribution for each beneficiary
- Develop final business case



Now we have secured finance

- Preparing for construction in 2023-2024.
- Upscaling the approach to enable stronger collaborative investment and develop into a repeatable process
- Formalise in a GM Integrate Water Management Strategy

Lessons learned – Building business cases

- Build awareness of, and appetite for, natural capital values
- Focus on key target beneficiaries, communicating specific benefits
- Understand your beneficiaries drivers and demand for benefits
- Understand the level of evidence required to unlock investment for different beneficiaries
- Build business cases collaboratively and work towards a fair proportioning of contributions
- Remember that the strength of NBS is in there ability to deliver on multiple benefits
- Collaboration and partnership working is key

Nature delivers value – but it's a long road to get people to pay for it

the ignition PROJECT

NATURE-BASED SOLUTIONS TO THE CLIMATE EMERGENCY

GREATER MANCHESTER
DOING THINGS DIFFERENTLY

UIA

European Union
European Regional Development Fund

REPUBLIC OF ESTONIA
MINISTRY OF THE ENVIRONMENT

LIFE SIP for Water

Enabling collaborative efforts for systemic change in Estonian river basin management

Henry Linnard

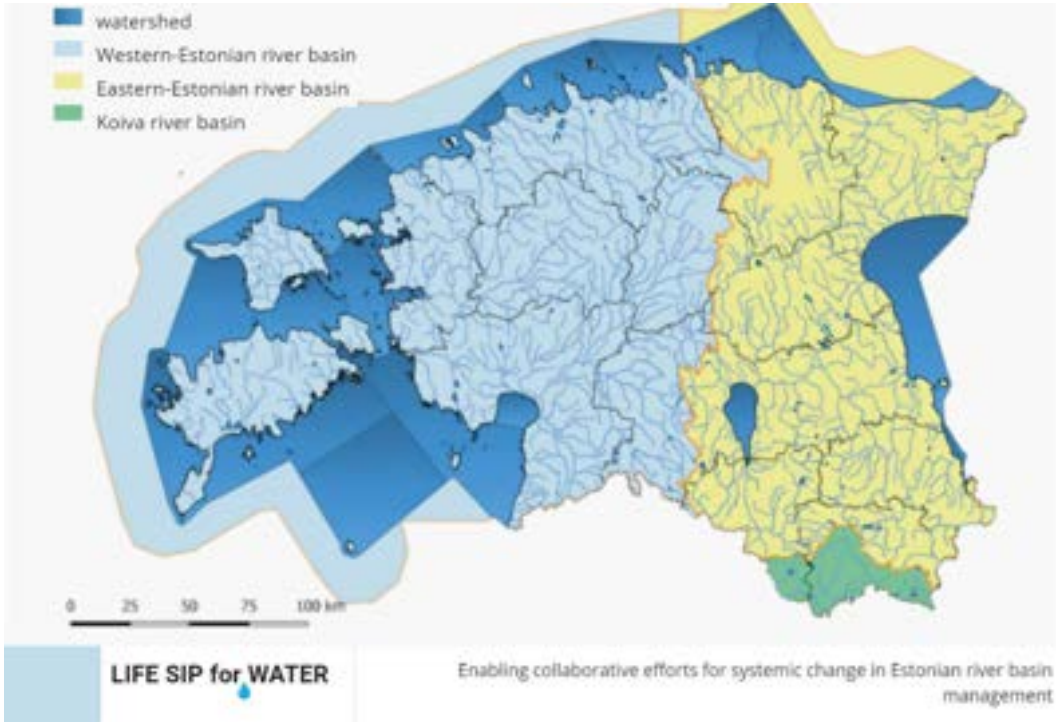
Communication Manager

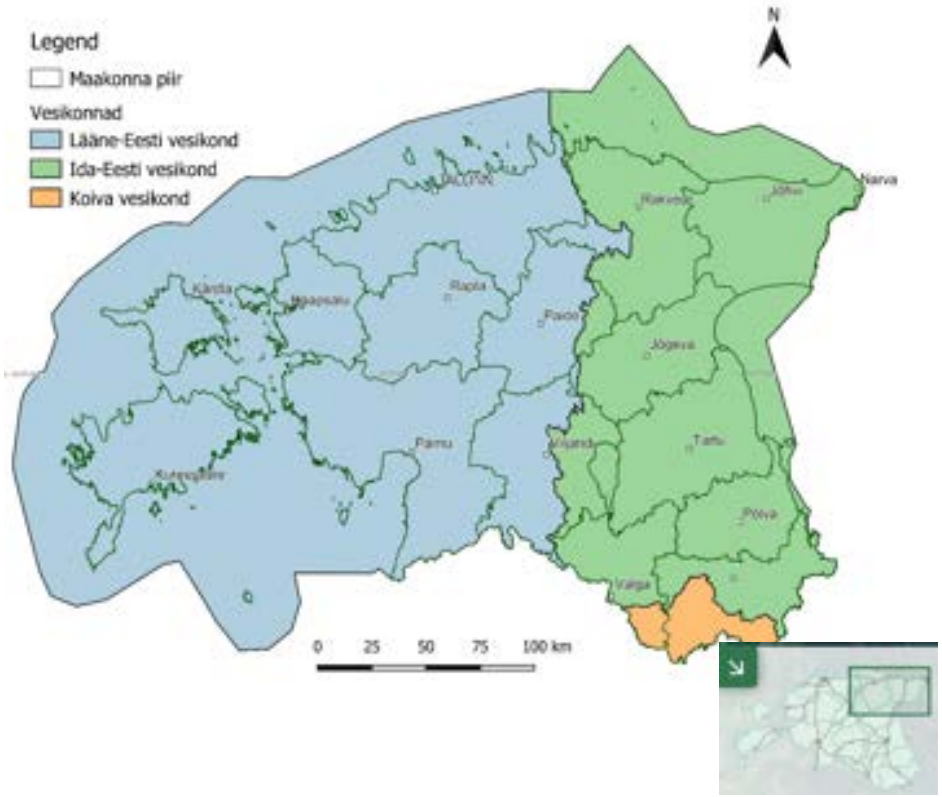
LIFE IP CleanEST

Manchester, 26.04.2023

Project targets

full implementation of Western-Estonian River Basin Management Plan 2022-2027




Legend
Maakonna piir
Vesikonnad
Lääne-Eesti vesikond
Ida-Eesti vesikond
Koiva vesikond
N
Narva
Rakvere
Jõhvi
Kärdla
Haapsalu
Rapla
Paide
Jõgeva
Pärnu
Kuressaare
Tartu
Põlva
Valga
0
25
50
75
100 km


Tallinn
Narva
Tartu
Pärnu

Duration and budget SIP for Water

10 years (2024-2033)

!

€ **27,8 M euros**

16,7 M euros LIFE SIP

11,1 M euros contribution of beneficiaries

Partners

Ministry of the Environment

19 Partners

Project objectives

Building administrative, digital, collaborative, integrated and legislative capacity

Aligning policies, methodologies and enabling collaborative governance and creating alliances for improved mechanisms and incentives

Piloting the novel methods, developing best and novel practices and solutions to solve river basin management challenges (ie design-thinking, nudging)

Engaging and committing quadruple helix stakeholders in participative and adaptive water management

Beyond macroenvironmental impact: building stable and sustainable water management foundation

LIFE SIP for WATER

SpO1: Building administrative, digital, collaborative, integrated and legislative capacity

SpO2: Aligning policies, methodologies and enabling collaborative governance and creating alliances for improved mechanisms and incentives

SpO3: Piloting the novel methods, developing best and novel practices and solutions to solve river basin management challenges

SpO4: Engaging and committing quadruple helix stakeholders in participative and adaptive water management.

SpO5: Beyond macroenvironmental impact: building stable and sustainable water management foundation

EFFICIENCY

SYNERGIES

BEST PRACTICES

AWARENESS & PARTICIPATION

AGILITY

COMPLEMENTARY INITIATIVES

FULL IMPLEMENTATION OF WE RBMP 2022-2027

Administrative measures

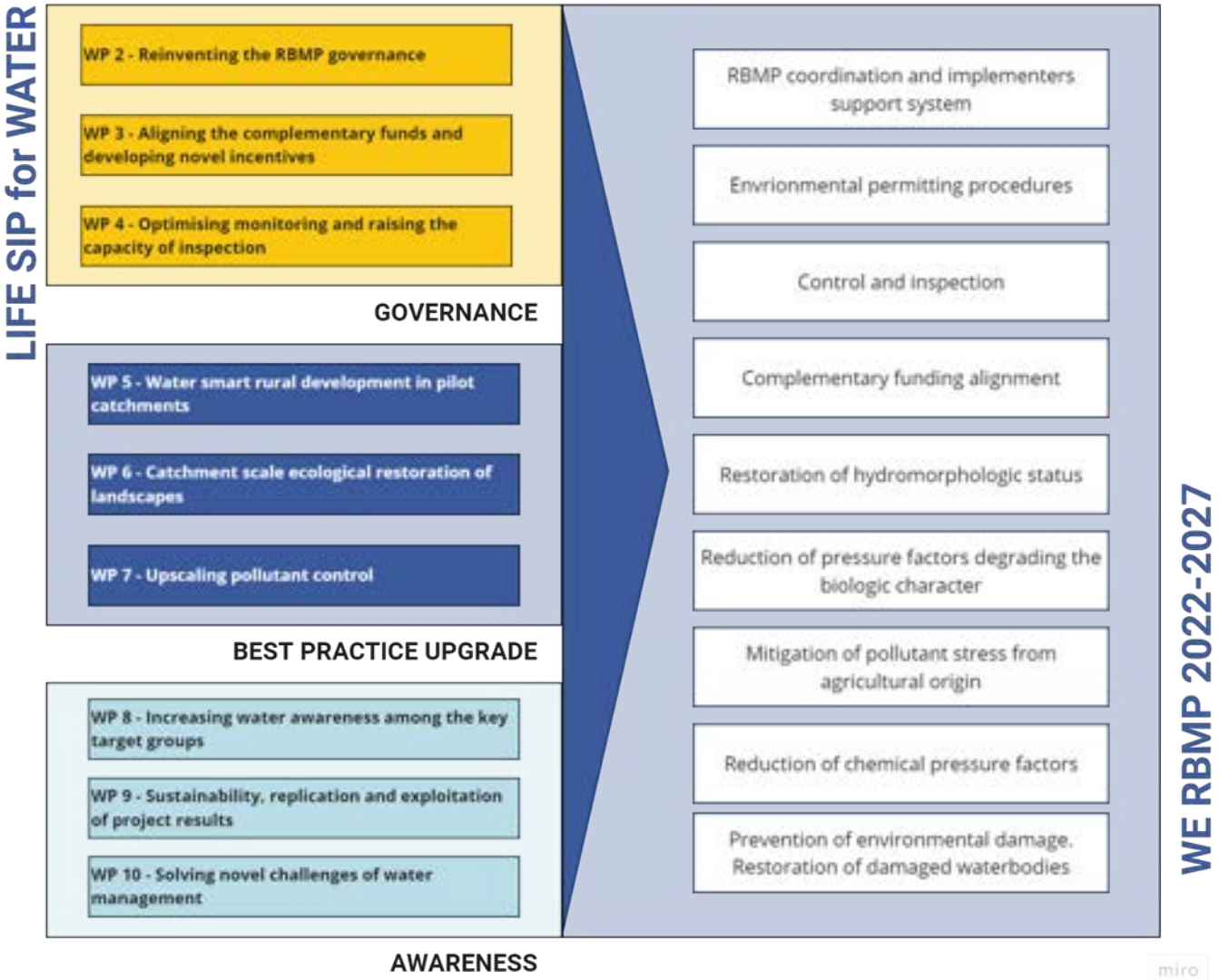
Coordination of technical measures & practical interventions

Knowledge-based management

Aware stakeholder participation

Preparing for RBMP 2028-2033

IMPROVED NATIONAL RIVER BASIN GOVERNANCE



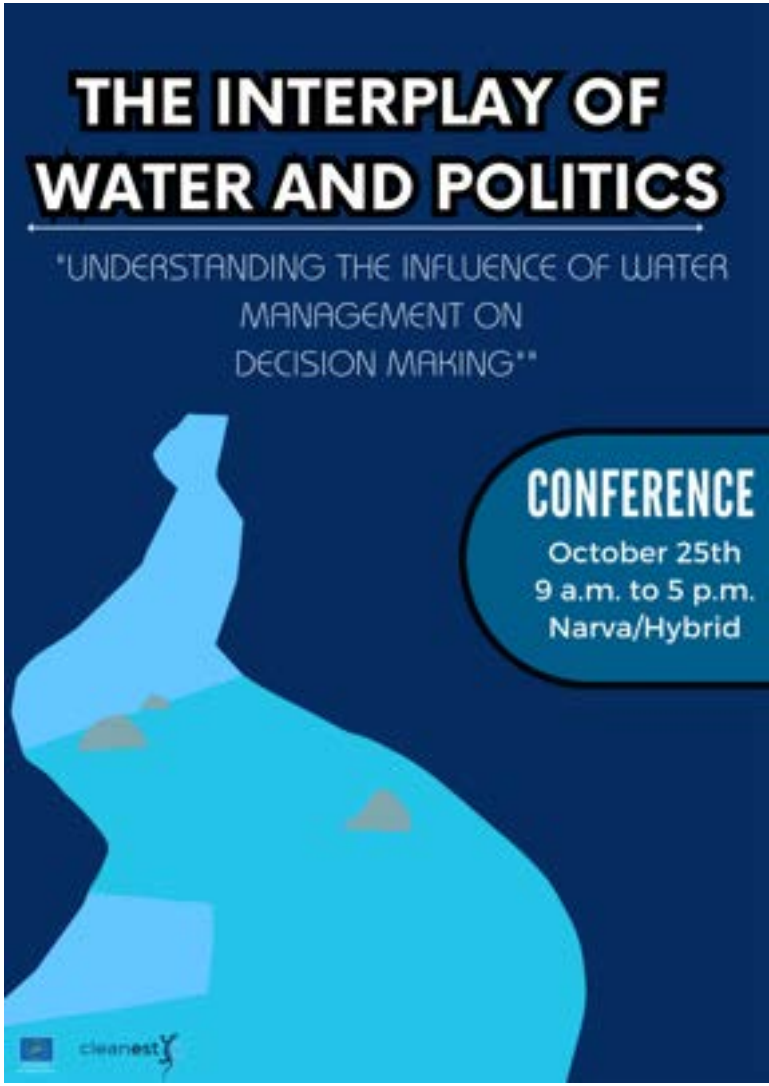
- 371 actions of 18 diferent measures on surface waterbodies
- Up to 15 actions of 5 diferent measures on groundwater bodies
- 68 actions of 48 general governmental measures

- Full implementation of 3rd WE RBMP
- Improved administrative capacity (people, systems ect)
- 35 M euros complementary funds allocated, at least 60 M euros applied for
- 1-2 new financial incentives developed, tested and rooted
- Supplementary agriculture measures piloted on 3-5 catchments and 1-2 new agriculture measures are worked out
- Ecological restoration of water regimes is carried out in 4 catchments
- 8 environmental facilities is constructed
- up to 3 dams removed and 2 water bodies habitats and spawning areas restored
- Biomanipulation piloted on lake Harku
- Up to 5 stormwater system are reconstructed and nature based solutions constructed
- Algae and shellfish farming is piloted in Haapsalu Bay to reduce nutrient loads

- 772 km of rivers and 9200 km2 of lakes status will be improved
- 90 km of rivers optimal flow rate will be endured
- Soil quality of 30% of the RBD agricultural land will improve
- 2 amphibian, 5 aquatic flora, 20 bentic fauna and 6 fish species population decrease will be halted and reversed
- Hg emission to air, PAH and POS emission to water will be decreased by 500 kg/year
- EB coordinators and ECAC consultants engage 8000 RBMP implementers
- EB inspectors conduct 1700 inspections and ensure 1700 environment user activity compliance with water protection requirements
- at least 500 people trained/awareness raised through events, trainings, seminars etc
- 2000 engaged in citizen science campaignes

LIFE IP CleanEST international conference

25-26 October 2023,
Narva, Estonia



- The aim of the LIFE IP CleanEST conference is to highlight the **challenges of modern water management** and how politicians can use different solutions to manage water resources.
- We will discuss how we can organize water management more efficiently and focus on **the impact of water pollution in the environment** and the need to control and reduce it.
- The target audience includes EU officials, politicians, national organization representatives, local authorities, universities, project stakeholders, LIFE IPs, external associations and organizations, researchers etc.

REPUBLIC OF ESTONIA
MINISTRY OF THE ENVIRONMENT

Thank you!

Henry Linnard

Communication ManagerLIFE IP CleanEST

henry.linnard@envir.ee