Pennon Stakeholder Forum

Let's Talk Water

Thursday 24 April
14:00 – 16:00

South West Water

Bournemouth Water

BRISTOL WATER

Welcome

Welcome to the 12th Let's Talk Water event -> a 2-hour webinar to share and discuss updates on our work with stakeholders…

The main themes of this webinar are:

1) Welcome & news + DWMP2 update
2) Focus session on Nature Based Solutions

Housekeeping

- Please keep cameras off and muted
- If you have questions, please post them in the chat and we will ask during the Q&A
- We will record the session (hence cameras off). Any objections, please let us know.
- *Please feel free to introduce yourselves in the chat*

South West Water
News Update

Carolyn Cadman

Director of Natural Resources

South West Water
Bournemouth Water
BRISTOL WATER

Drainage and Wastewater Management Plan

Let’s Talk Water
24 April 2025

South West Water

Background: Cycle 1

Why do DWMPs exist?

- To provide a long-term strategic view of the current and emerging risks and challenges faced by wastewater service providers and the investment scenarios that we propose to employ to address/manage these risks

- We successfully completed the first Drainage and Wastewater Management Plan for South West Water in 2023.

What is a DWMP?

A Our Drainage and Wastewater Management Plan – or DWMP – outlines how we will manage our drainage and wastewater assets for the next 25 years.

Our DWMP sets out the risks and challenged we face and the actions we need to take, to ensure our drainage and wastewater system is **resilient** to future pressures such as **population growth** and **climate change**.

Our DWMP will:

Protect people, homes and businesses from flooding

Increase the use of **nature-based solutions**, innovating to protect our unique environment

Be influenced by our **stakeholders** and the risks and issues they prioritise to protect the environment

Support tourism and the long-term economic well-being of the region.

Above all, our DWMP is a plan for the environment. We understand the challenges our wastewater and sewerage networks face over the next 25 years – and we are committed to investing and working in partnership with our communities to meet these challenges.

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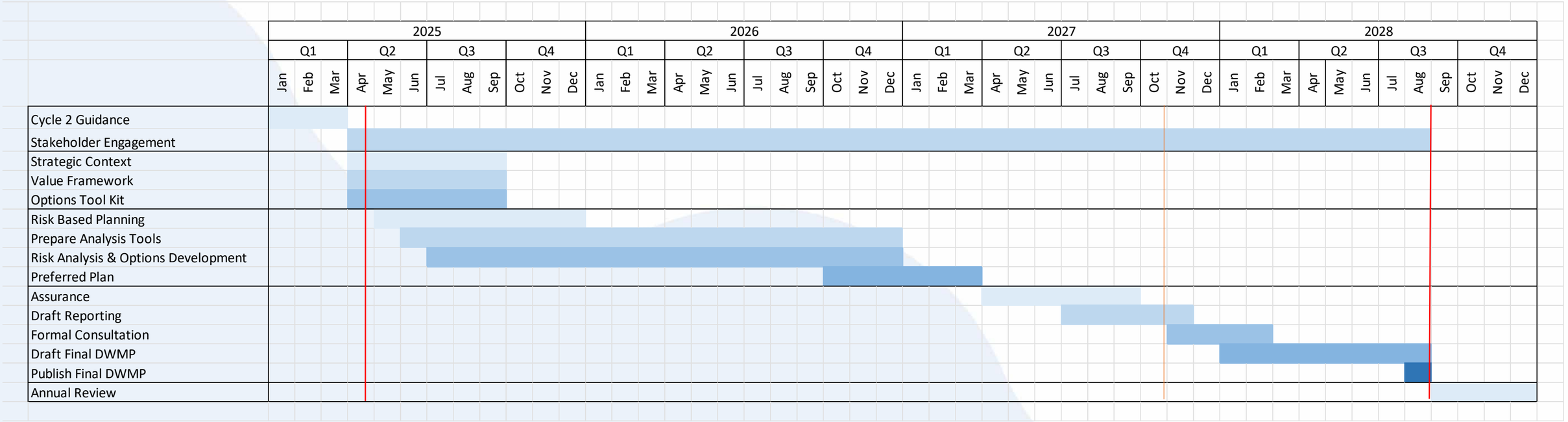
When will all of this happen?



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How is it created?

Know our assets

Level 1- Company Wide

Level 2- River Basin

Level 3-
Wastewater Catchment

Level 4-
Local

Understand the risks

Risk Based Planning

WINEP

PR29 SOAP

Flood Risk Plans

River Basin Management Plans

Assess the risk
Evaluate the solutions

Risk Assessment and Options development

5 15 25+ years

Programme optimisation, alignment to wider plans

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What do we measure?

Common Performance Indicators

- External Flooding
- Internal Flooding
- SO Performance
- WwTW Compliance (N)
- WwTW Compliance (D)
- WwTW Compliance (DWF)
- WwTW Compliance (FFT)
- River Water Quality
- Pollution Incidents (1-2)
- Pollution Incidents (Total 1-3)
- Bathing Water Quality
- Shellfish Water Quality

Emerging Performance Indicators

- WwTW Compliance (Descriptive)
- River Water Quality (Shared Responsibility)
- Surface Water Flooding (Shared Responsibility)
- Emergency Overflow Performance
- Groundwater Pollution
- Groundwater Infiltration

Bespoke Performance Indicators

- Coastal Flood Risk

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What are the outputs?

Innovation

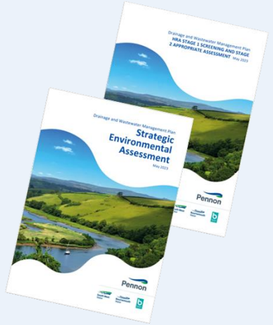
Green Solution Potential

Solution Collaboration

Partnership Potential

Wider Environmental & Societal Benefits

A long term 25-year plan:



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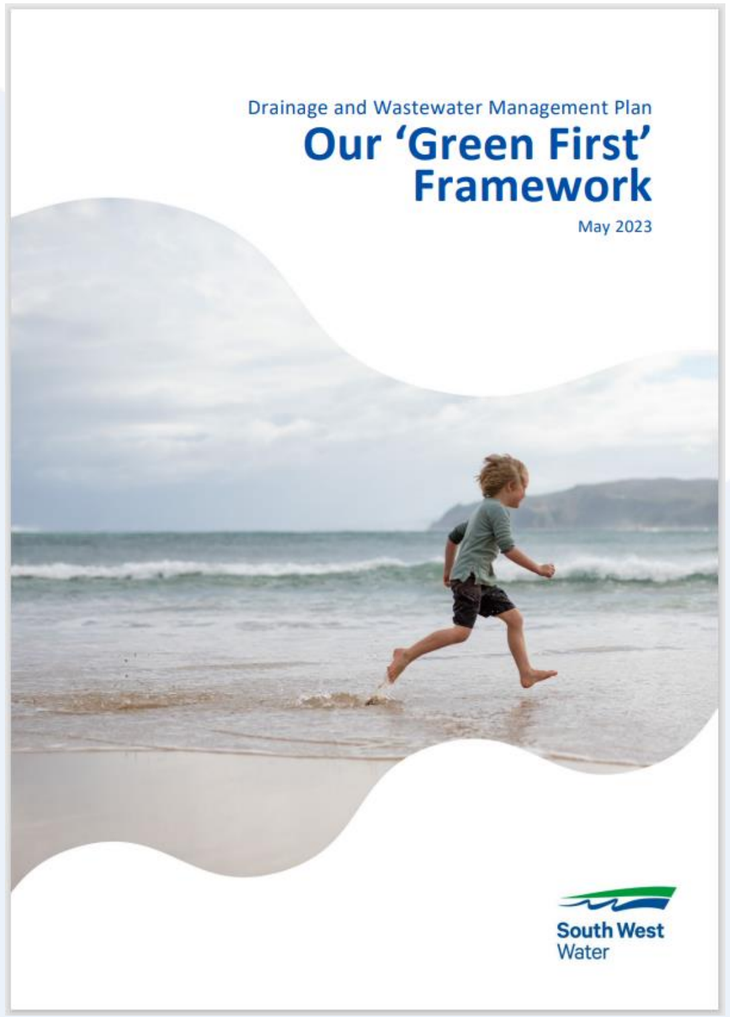
What's new this time?



- Much greater emphasis on stakeholder engagement. Stakeholders will be instrumental to forming and shaping the plan and to the delivery of the outputs.
- During cycle 1 we outlined the need for a green first approach. We recognised the importance of doing things differently, taking a “Green First” approach.
- During cycle 2 we will be working on implementing this in practice. We will work with natural processes and nature-based solutions, which provide wider public benefits with a lower carbon footprint and collaborate with partners, where possible.
- Our performance indicators have increased in number to cover a wider range of aspects that consider environmental impacts complementing the implementation of our green first approach.

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What does this mean for you?

The next 5 years, to 2030, are within the AMP8 Plan and focuses on the delivery of our Storm Overflow and river water quality programmes.

For this next section we need to think beyond 2030 to 2055

- Our priority catchments will be identified for the long-term planning horizon
- The potential for collaborative working will be identified
- The earliest opportunity for us to work with you in co-creating solutions to common problems

- Does your organisation want to be involved?
- Key contacts in your organisation to support development of DWMP?

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How does this make a difference?

You said, we did.

Your feedback has a direct influence on our plan. Over the next three years we will have meaningful engagement with our stakeholders that will help to shape our plans.

In cycle 1:

Our technical groups enhanced our plans:

- Coastal Risk added
- Critical drainage areas added
- Local knowledge and expertise refined the plan

Our Stakeholder Forums enhanced our plans:

- Customer priorities
- Shift in focus to Storm overflow use

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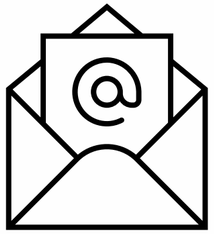
What’s next?

We will be doing a lot of engagement with our customers and stakeholders over the next 3-years and we are inviting you to take part in a number of ways:

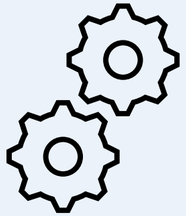
Stakeholder Forum

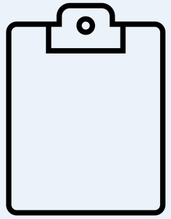
Workshops

Mailbox



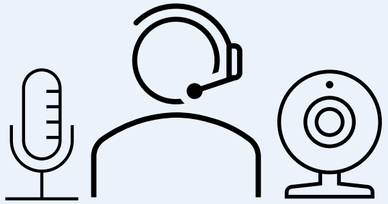
Technical advisory groups





Online Surveys

Webinars



Focus groups

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Get involved

Want to join our forum, focus groups or technical advisory groups?

Please send your contact details and areas of interest to DWMP@southwestwater.co.uk

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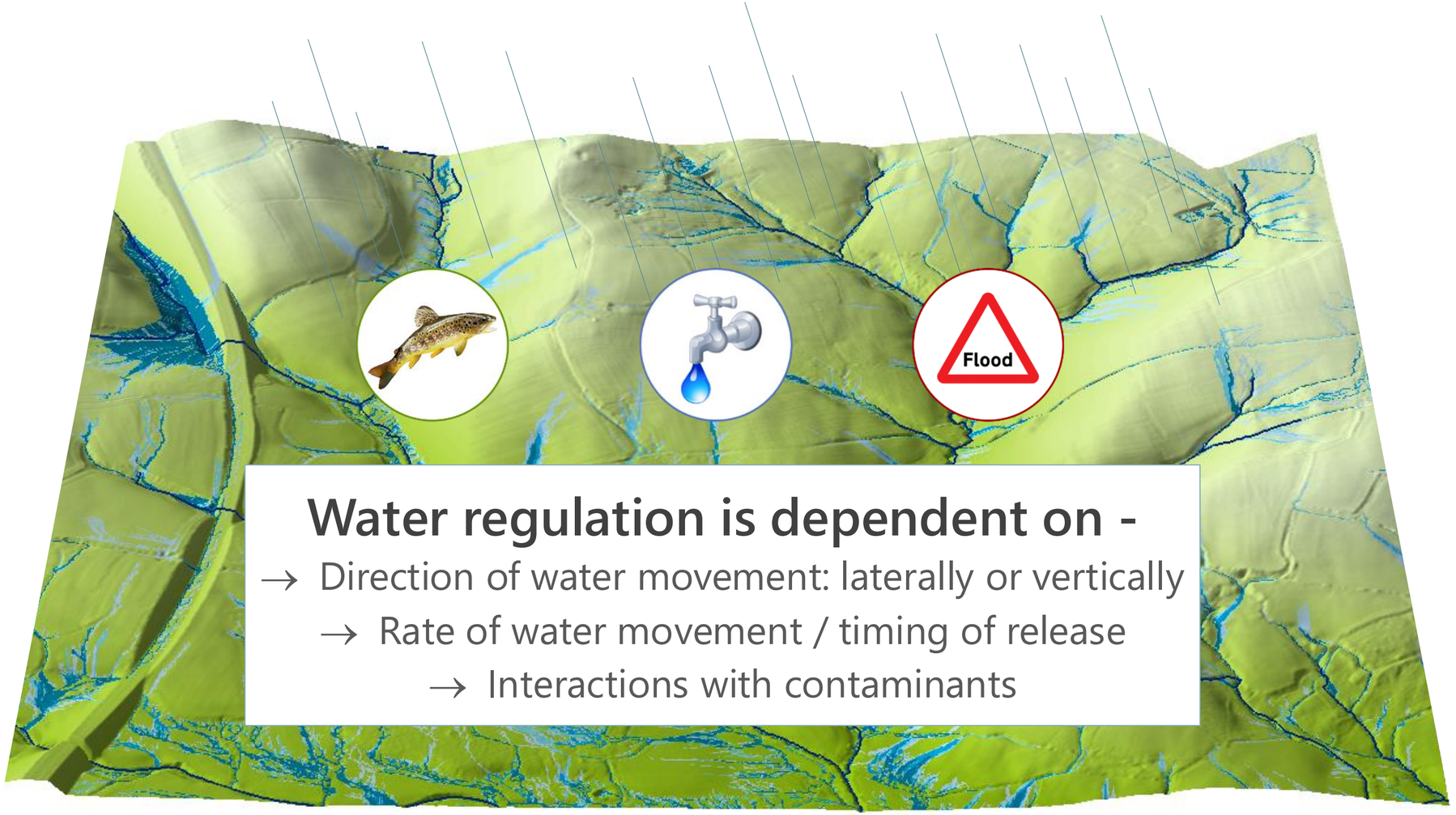
Nature-Based Solutions

for sustainable water management

The Natural Water Cycle

A fundamental processes we depend on …when the landscape is healthy & functioning…



Water regulation is dependent on -

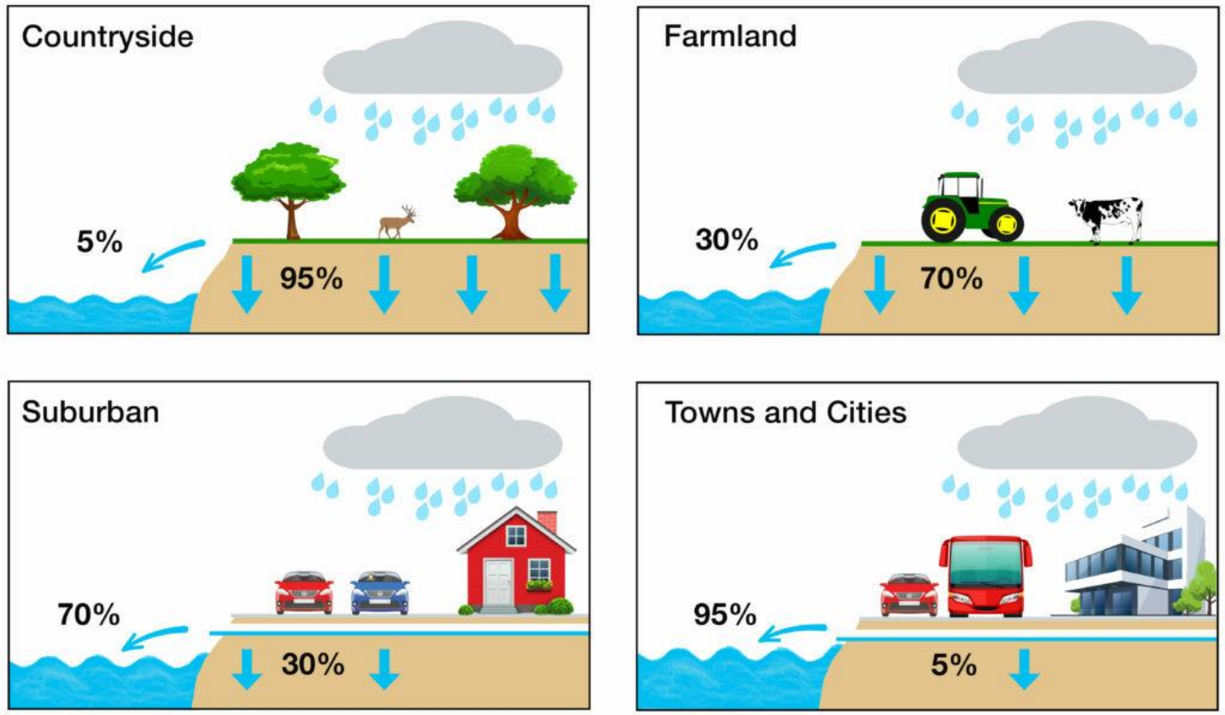
→ Direction of water movement: laterally or vertically

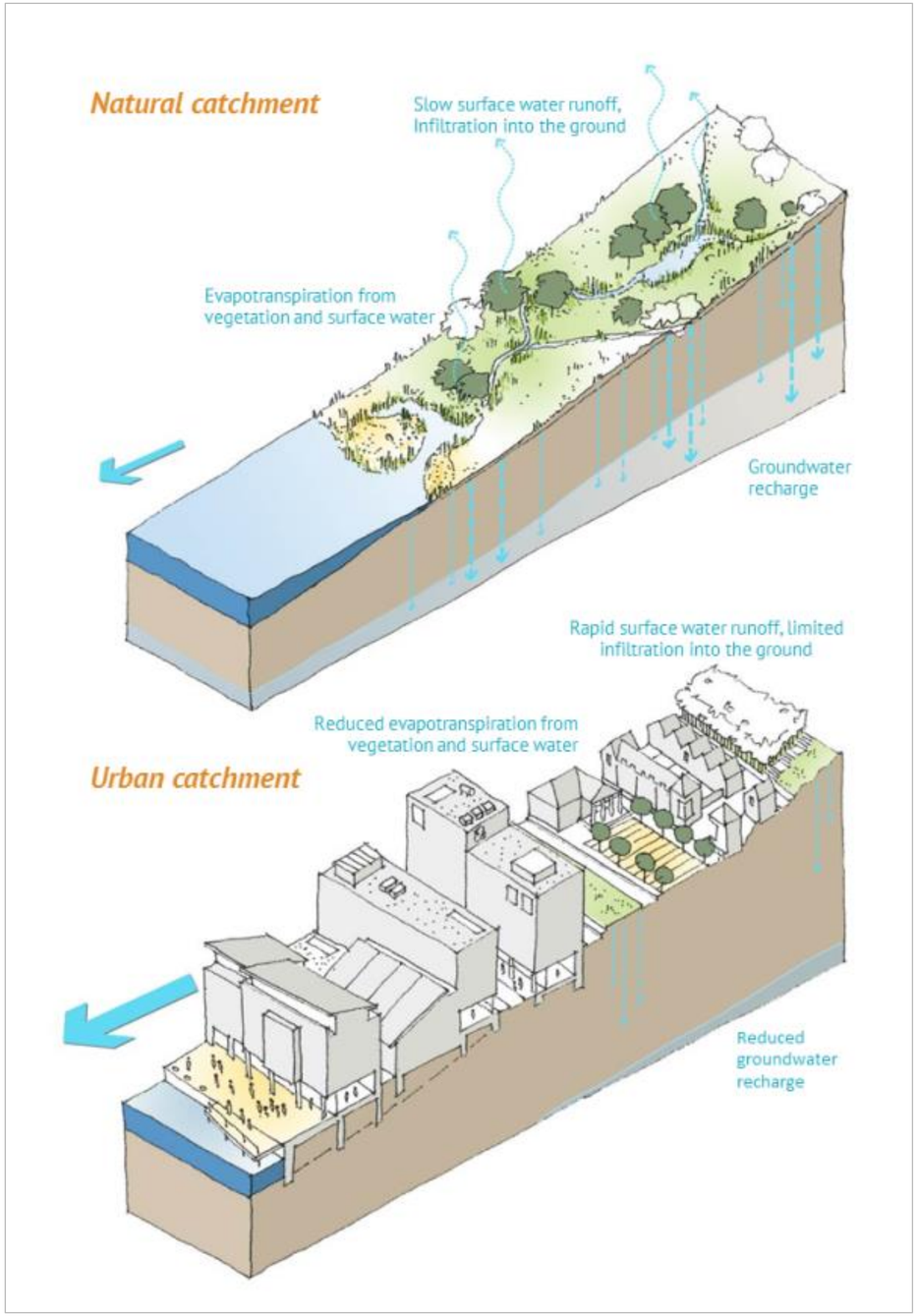
→ Rate of water movement / timing of release

→ Interactions with contaminants

Human pressure --> System disfunction

When the natural water system is put under pressure it starts to disfunction and this can cause negative impacts –





TYPES OF WATER MANAGEMENT SOLUTION

Types of Solutions

Traditional Engineered solutions

Storage

Shaft tank

Box culvert

Sewage Treatment Works Upgrade

Infiltration and Inflow

Investigation

Relining/replacement

Surface Water Separation / Upsizing

Laying new surface water sewers / upsizing existing

What are nature-based solutions…?

- Working with natural processes
- Green and blue infrastructure (GBI)
- Ecosystem restoration/adaptation measures
- Natural Flood Management (NFM)
- Water Sensitive Urban Design (WSUD)
- Catchment Management / Catchment Sensitive Farming

How do they work…?

- Restore or mimic ecosystem functions
- Interrupt ‘Source – Pathway – Receptor’

What problems are they the solutions too…?

- Anthropogenic
- Environmental/ecosystem disfunction
- Hydrometeorological hazards – resilience

What can they **not** do…?

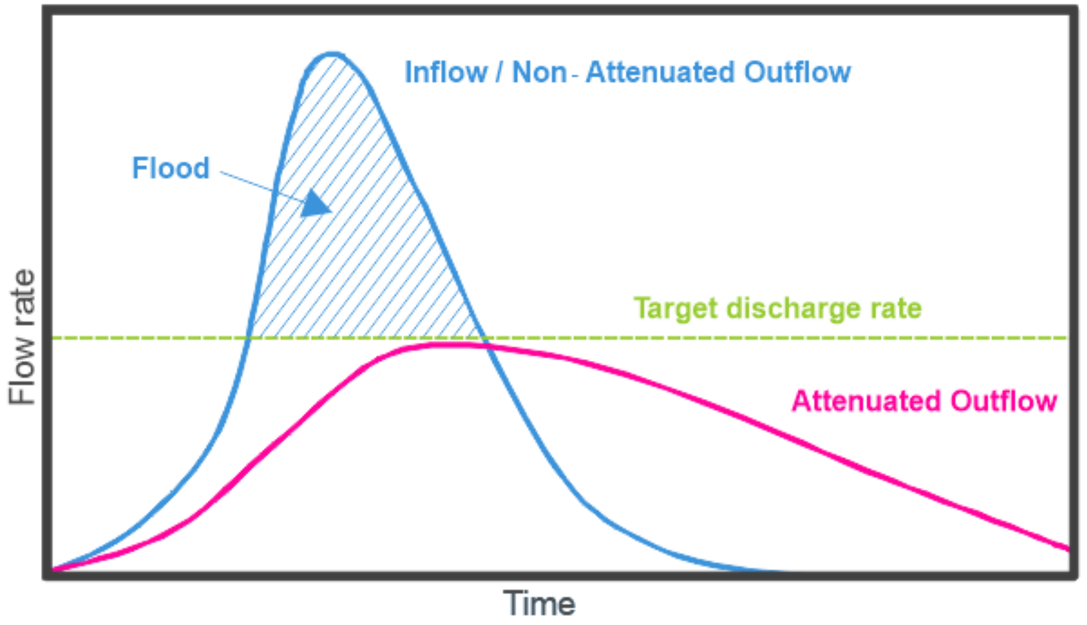
- Solve all our problems on their own
- Succeed without key barriers being overcome first

NFM – SuDS – WWNP – WSUD
THE CORE CHALLENGE

At their core these are all –

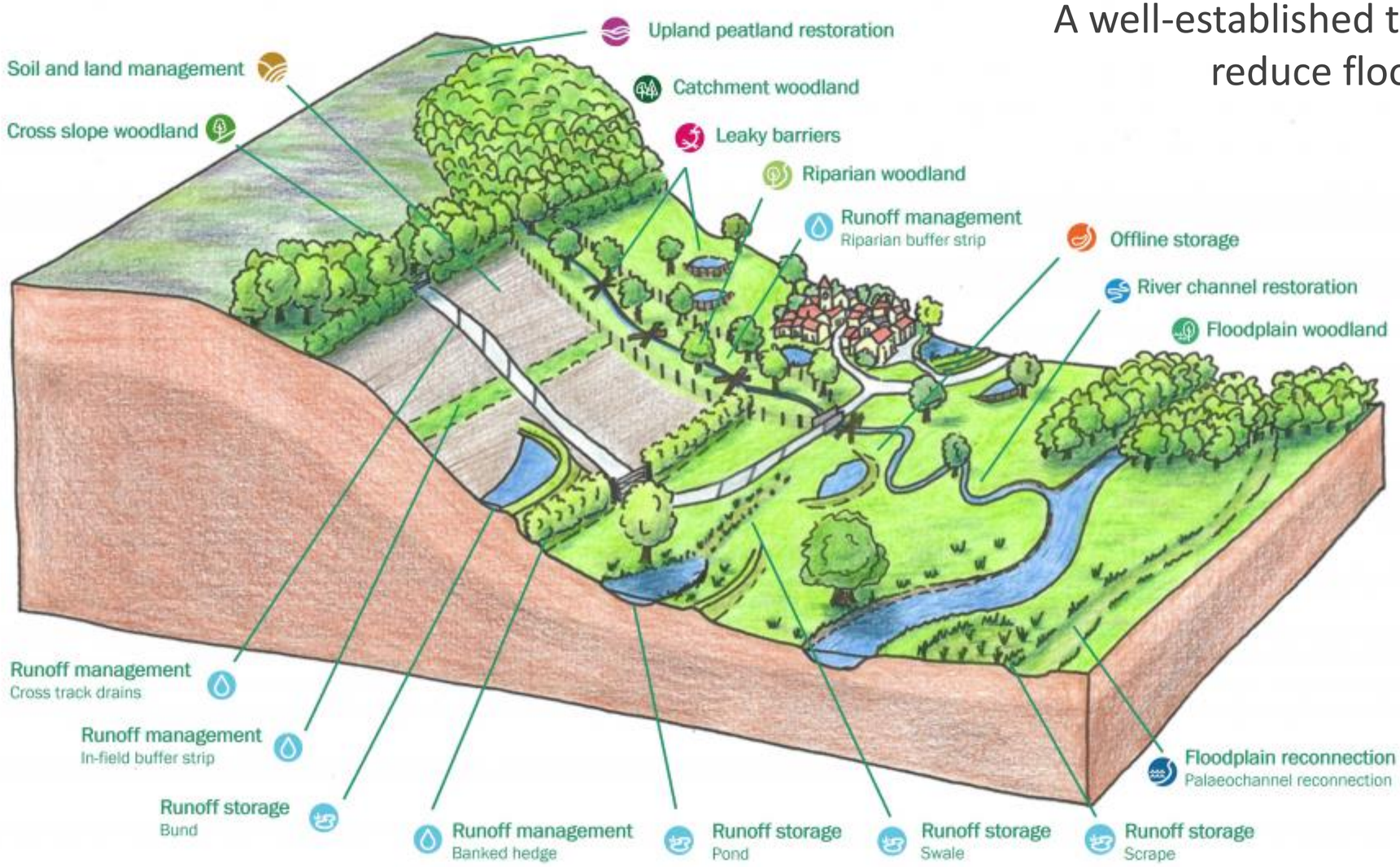
‘Natural capital’ and/or ecosystem restoration approaches…NBS

Improving ESS benefits provided by key natural capital assets via a collaborative and evidence-led approach



‘Working with Natural Processes’

A well-established toolbox of measures to reduce flood generation

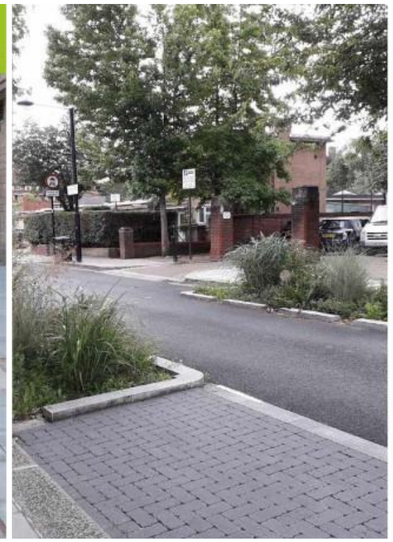


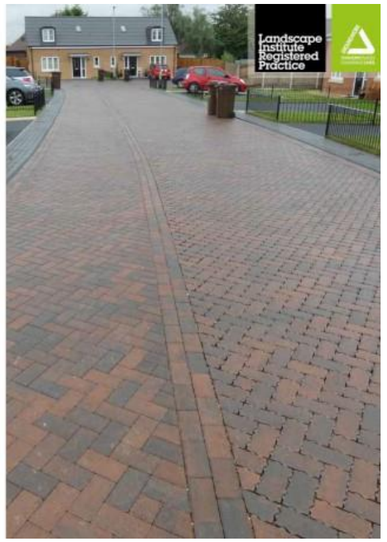
Types of Solutions

Urban Nature-Based or ‘Green/Blue’

Swales, ponds/basins

SuDS





Rain gardens, permeable paving

SWOT Analysis

Advantages (strengths) of NBS…

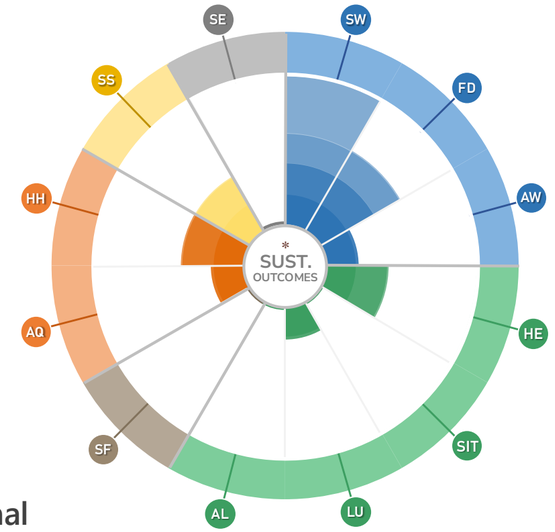
- Environmental solutions to environmental problems
- Multiple benefits / more diverse impacts
  – environmental, social, cultural, economic
- Lower GHG emissions
- Can be cheaper…and more cost effective…?
- Often win-win solutions (multiple beneficiaries)
- Can be more appealing to communities

Potential (opportunities) for success…

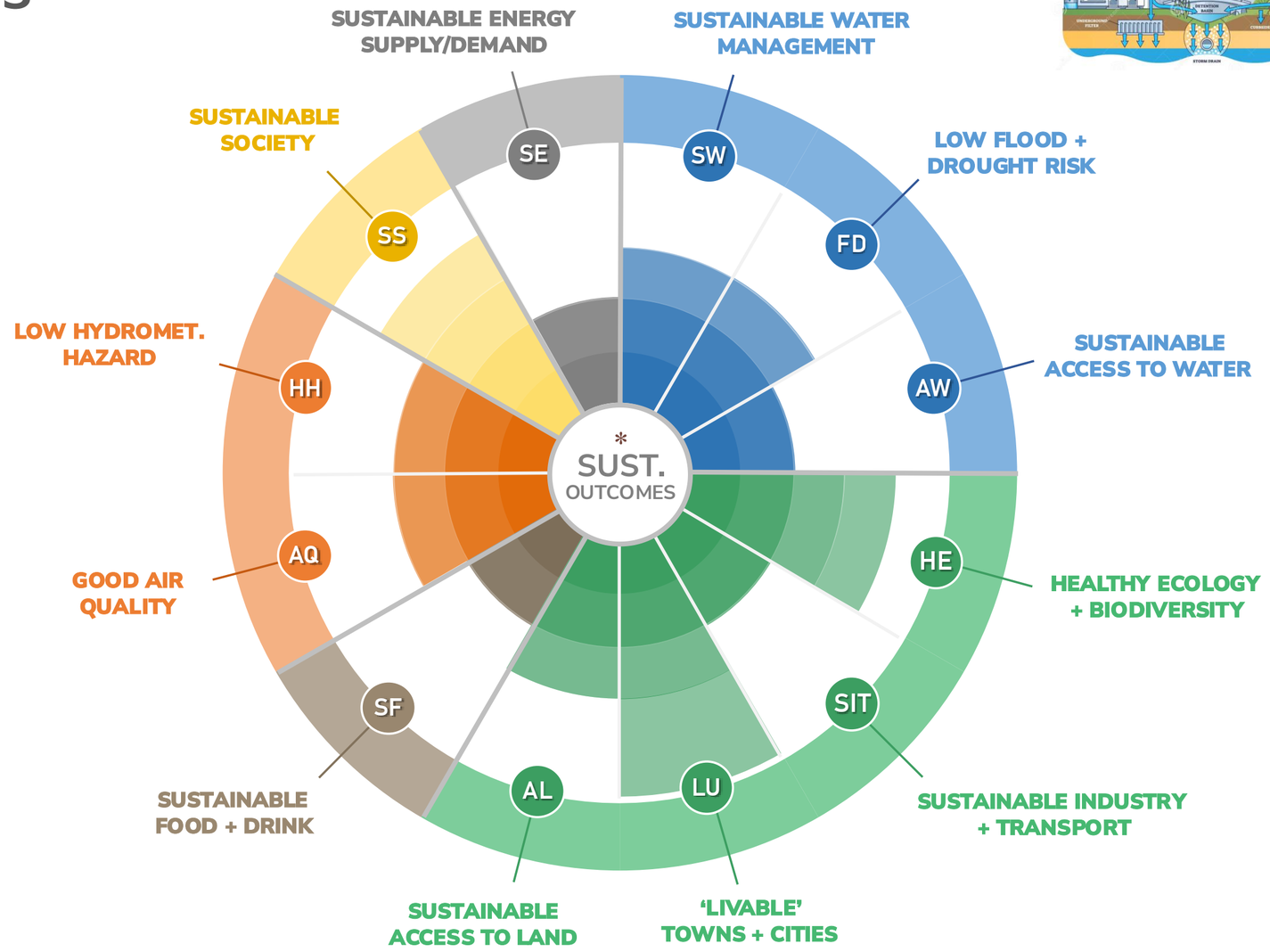
- Transition to sustainability (and beyond)
- Climate mitigation (net zero)
- Climate adaptation and resilience
- Effective in rural and urban landscapes
- Green economy – employment, finance, security…

Potential benefits of…

‘NATURE-BASED SOLUTIONS’

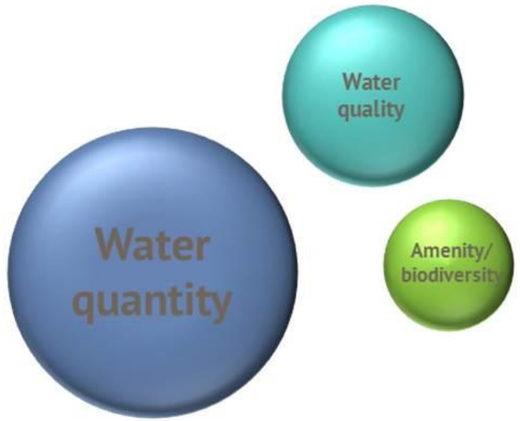


Cp with traditional engineered solution ->



Types of Solutions

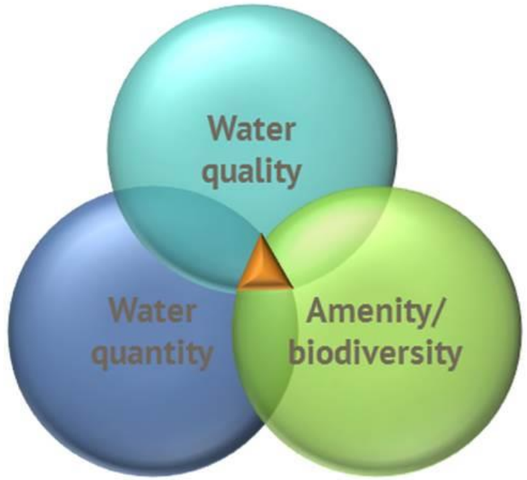
Sustainable Drainage Solutions (SuDS)



The "traditional approach"

Surface water is conveyed away from our cities and towns as quickly as possible to primarily manage risks from flooding and poor sanitation.

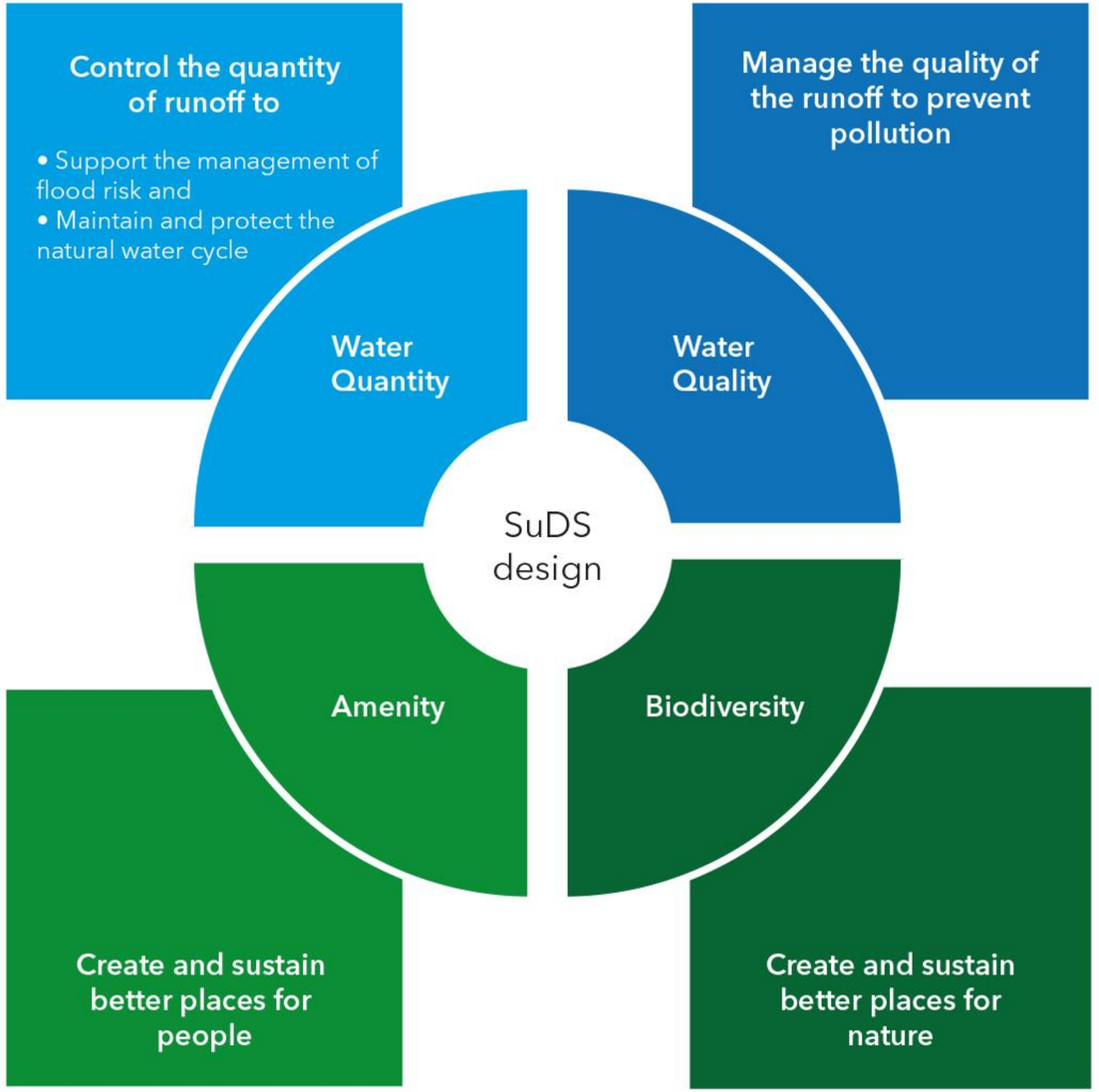
Water quality, amenity/biodiversity are given very little consideration.



The SuDS triangle

The SuDS philosophy is to replicate, as closely as possible the natural drainage from a site before development.

SuDS is designed within the opportunities and constraints of a site to deliver the most benefits for water quantity, quality and amenity/biodiversity. Where these objectives overlap this is called the SuDS triangle.



Limitations (weaknesses) of NBS

- Lower certainty of primary outcome
- Ineffective if not targeted and designed correctly
- Can fall short of required impact ‘at scale’
- Can require more space and take longer to implement
- May have lower resilience and longevity
- Can be technically demanding to deliver
- Gentrification risk – ‘beneficiary swapping’

Barriers (threats) to success

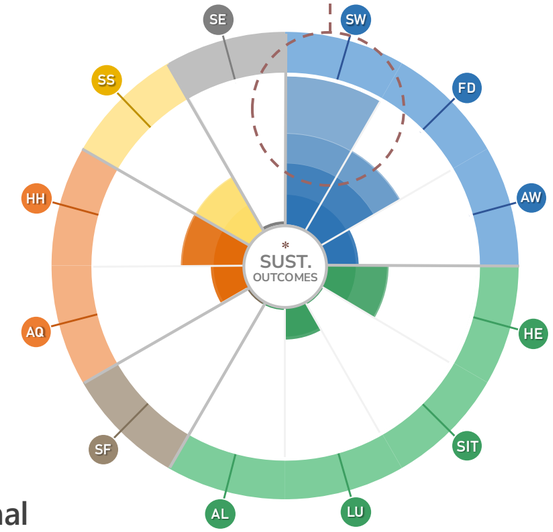
Interaction

- Acceptability – ‘trade-offs’
  - Socio-economic – ‘willingness to accept’
  - Cultural (community, policymakers and institutional)
- Policy, governance and funding
- Certainty of outcomes
- Resilience and longevity
- Capability and capacity to deliver

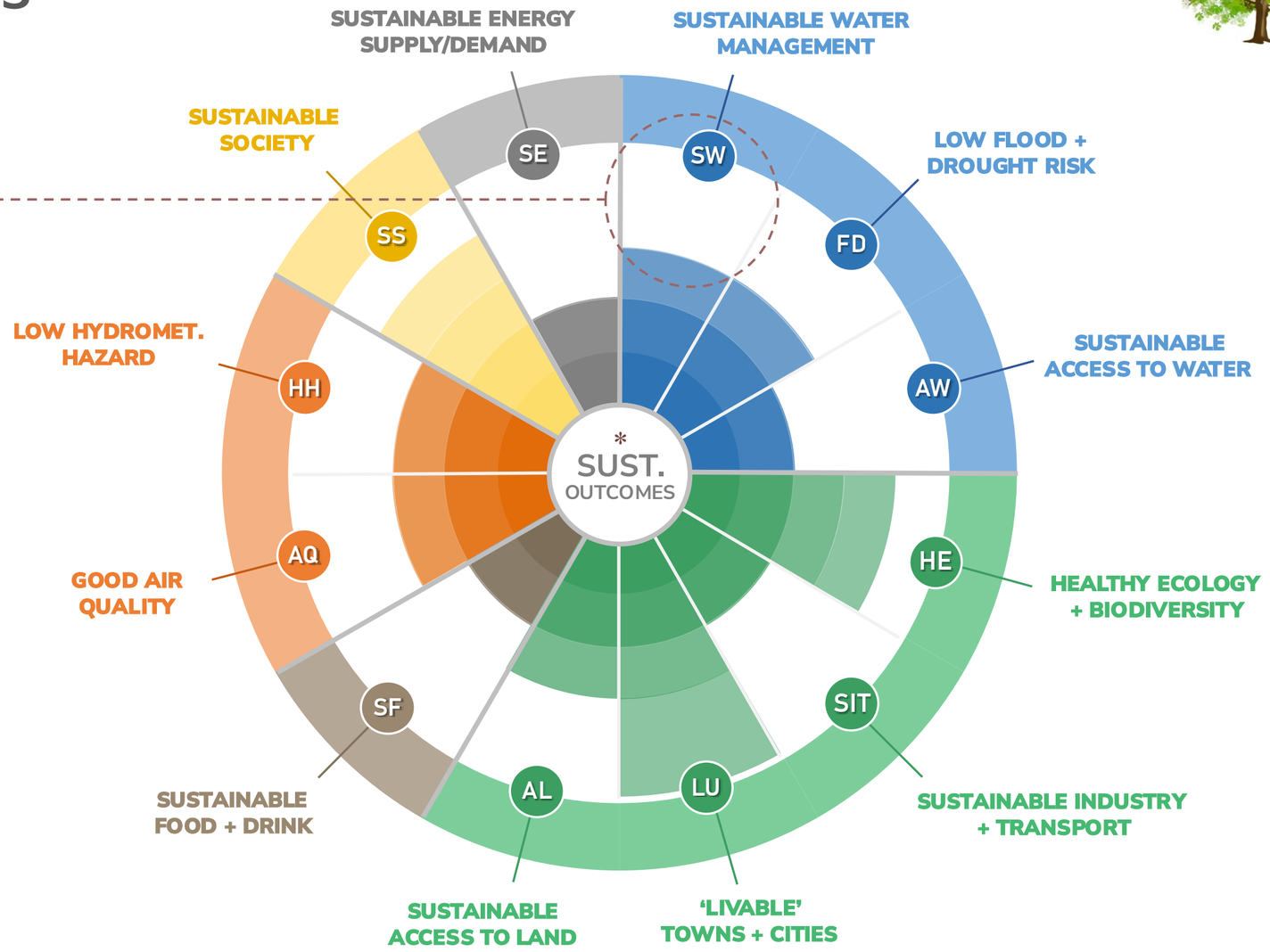
Potential benefits of…

‘NATURE-BASED SOLUTIONS’

Trade-off?



Cp with traditional engineered solution ->



Need to know where the water is coming from + root cause…

Water system dysfunction

(both sides)

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Bournemouth Water

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PR24 Common performance commitments

Ofwat

Biodiversity

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UK presidency of COP26 (2021)

Governments are putting nature restoration at the top of corporate agendas, with urgency.

UK Environment Act (2021)

10 goals

No.1 – thriving plants and wildlife

Government priorities for Ofwat

1) Protect and enhance the environment
2) Resilient sector – risk management
3) Protect customers
4) Sustainable investment

Ofwat have introduced a broader range of environmental commitments for 2025-2030 and beyond

Reduced use of storm overflows

Eliminating serious pollution incidents

Improving biodiversity

Improving bathing water quality

Reducing GHG emissions

<u>3 new Common Performance Commitments</u> (out of 23 in total)

Mandated for all water companies; ambition of forecast balanced against what is realistically deliverable.

- **Phosphorous Reduction** – to further improve river water quality
- **GHG Reduction** – towards reaching net zero
- **Biodiversity Enhancement** – improving habitats to reverse the decline of species

1

Ofwat

Biodiversity

Purpose: This performance commitment is designed to incentivise the company to conserve and enhance biodiversity in the exercise of its functions.

2

GOV.UK

Statutory 10% Biodiversity Net Gain (BNG)

What developers have to do

There is step by step guidance for developers.

Unless exempt, developers of major developments in England are required to provide 10% BNG once it becomes mandatory.

The right thing to do...

1. Protect the best – take action to protect the valuable biodiversity that we have on our landholdings

2. Restore and enhance the rest – take action across our landholdings and assets to enhance biodiversity in the everyday management of our sites

3. Collaborate beyond our land – work in partnership with others across the region, taking a catchment approach, to deliver biodiversity enhancement and nature recovery

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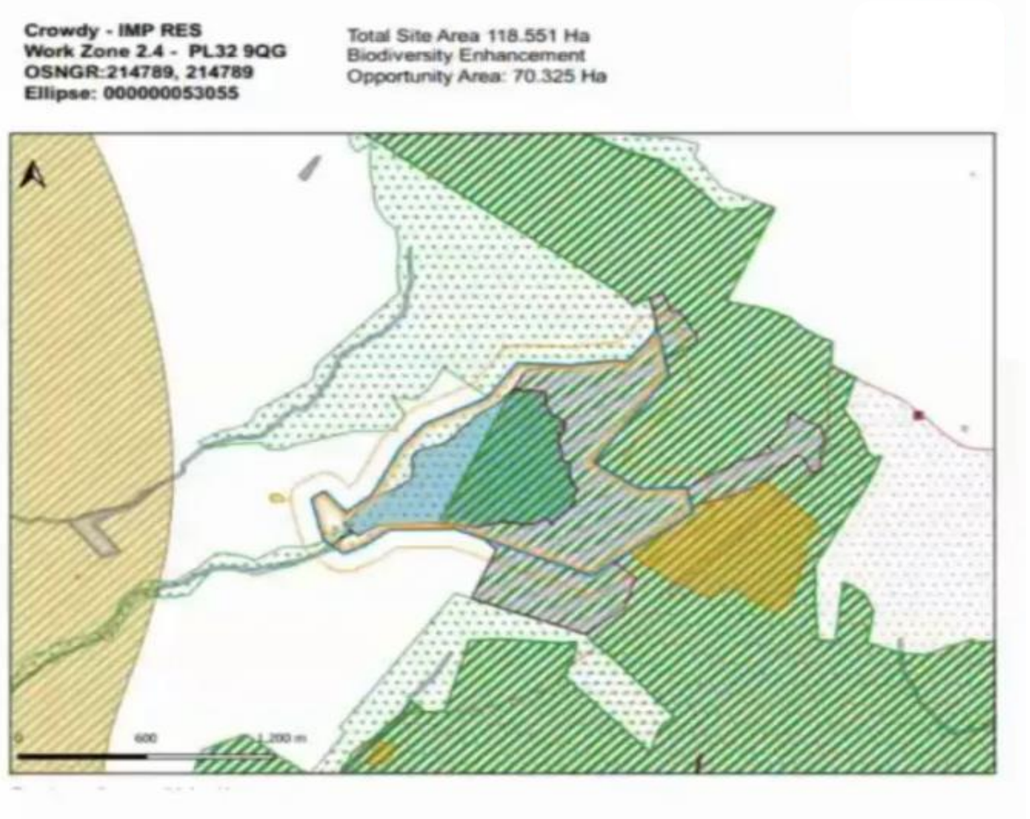
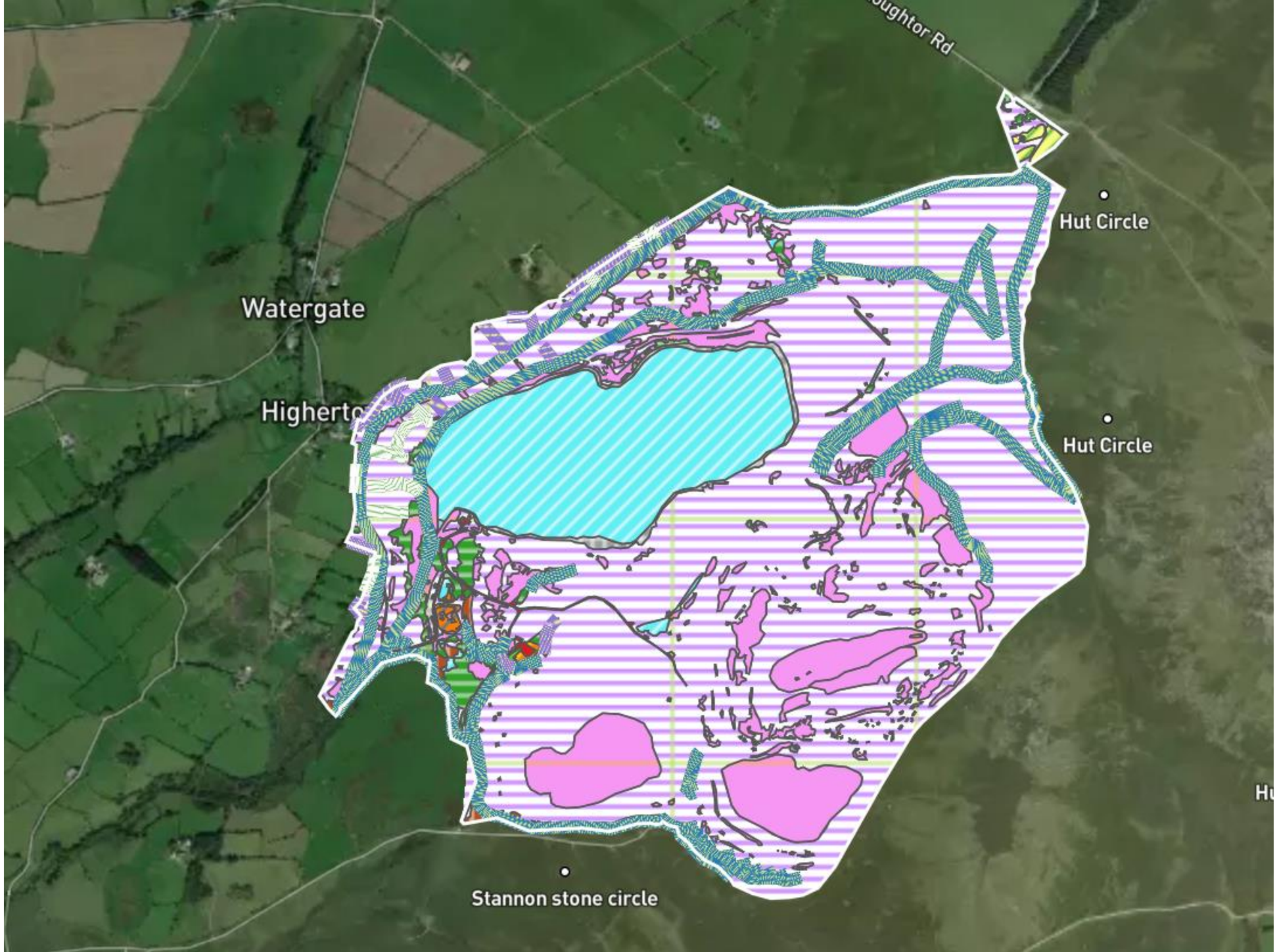
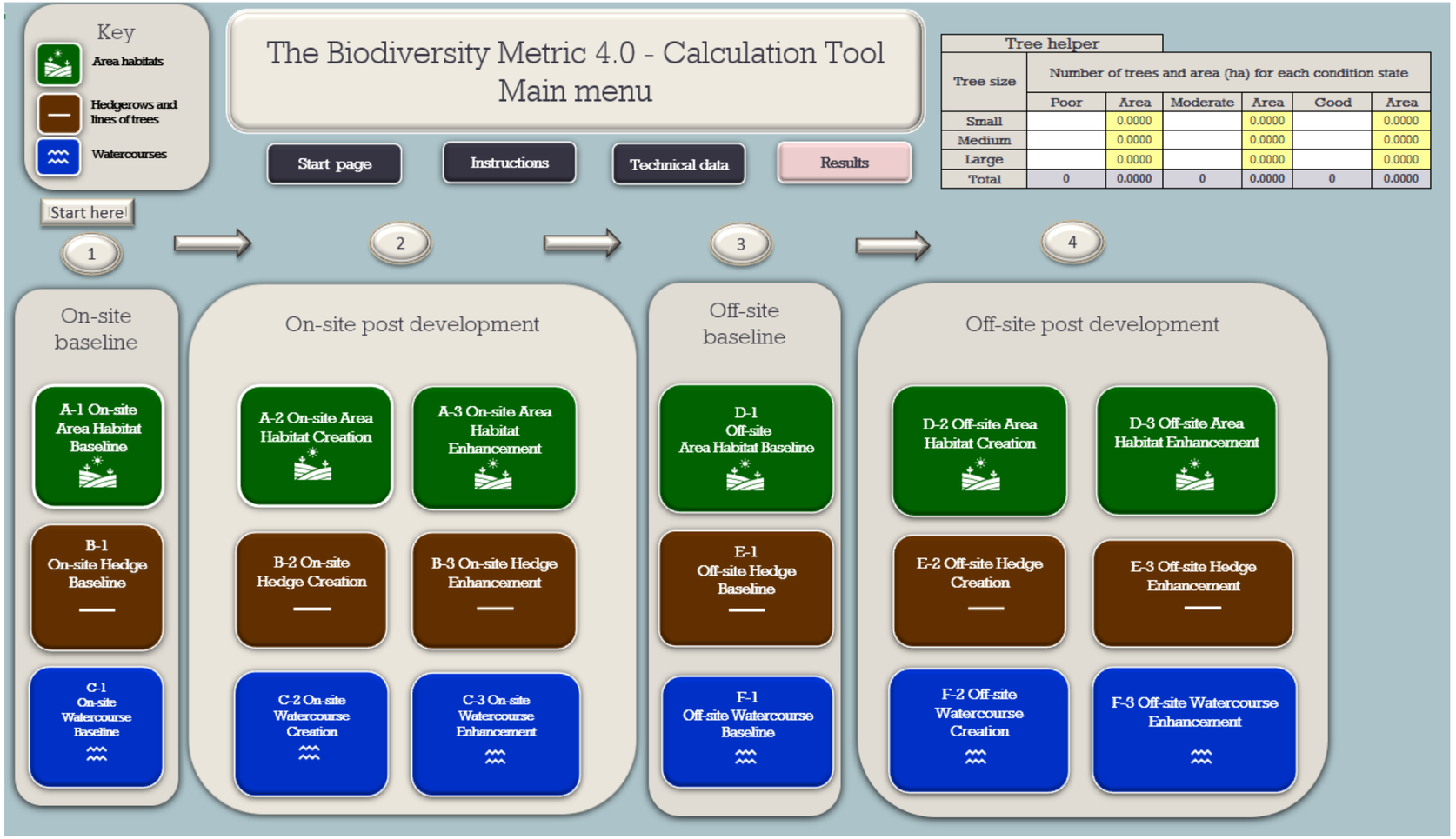


- Special Areas of Conservation
- Sites of Special Scientific Interest
- County Wildlife Sites
- National Landscapes (AONBs)
- Nature Reserves

… and more





Quantity ✖ Condition ✖ Significance

BIODIVERSITY UNITS

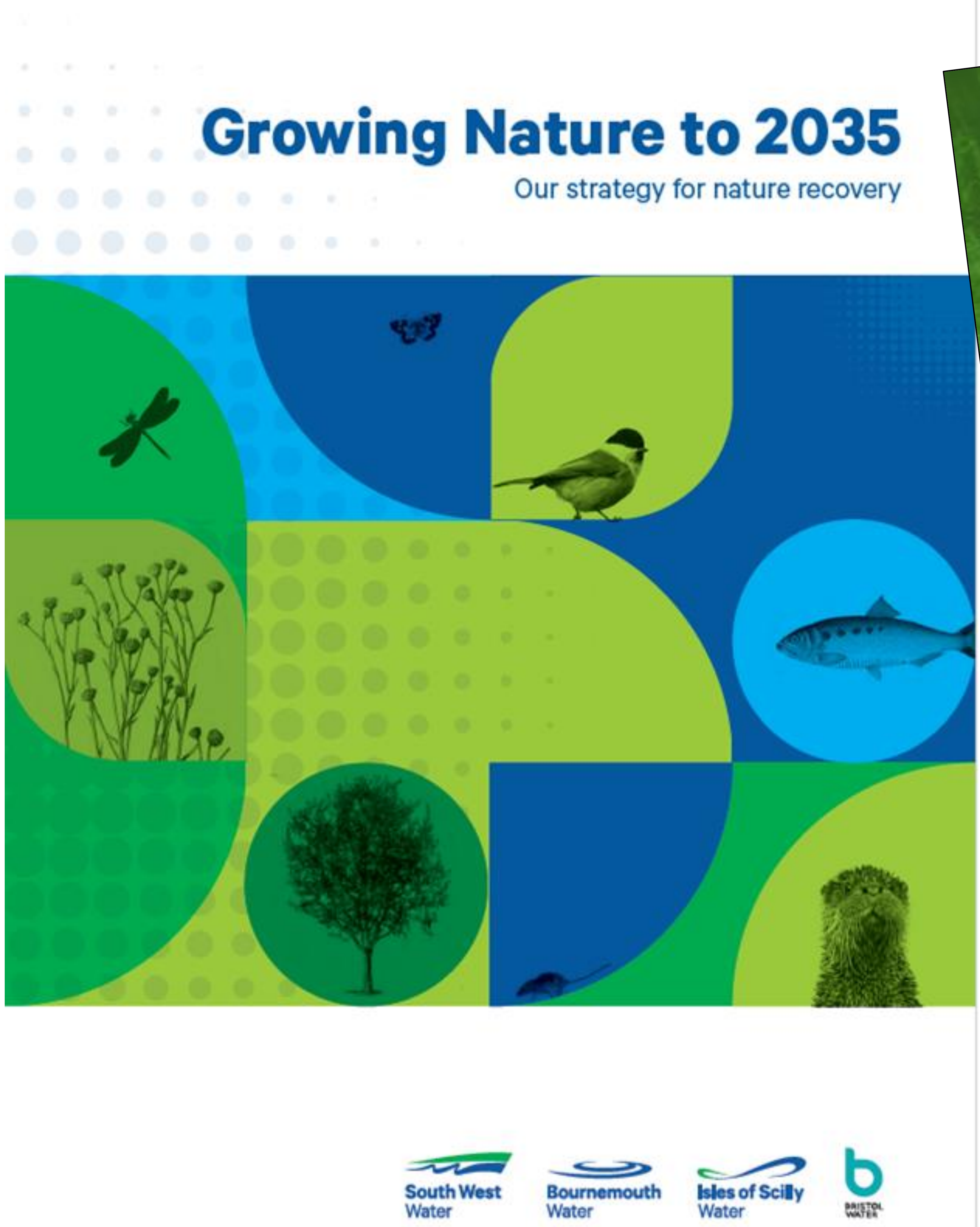
- 1 ha of mixed scrub in poor condition with low significance = **4 units**
- 1 ha of upland acid grassland in moderate condition with low significance = **8 units**
- 1 ha of lowland mixed deciduous woodland in fairly good condition and formally identified with significance in local strategy = **17.25 units**
- 1 ha of blanket bog in moderate condition and formally identified with significance in local strategy = **18.4 units**

BIODIVERSITY UNITS

Trade Offs

CARBON UNITS tCO2e

Synergies



Devon County Council

CORNWALL COUNCIL

Devon Local Nature Partnership

Catchment Management & Nature Based Solutions

Dr. David Smith

Natural Resources Manager

South West Water

Bournemouth Water

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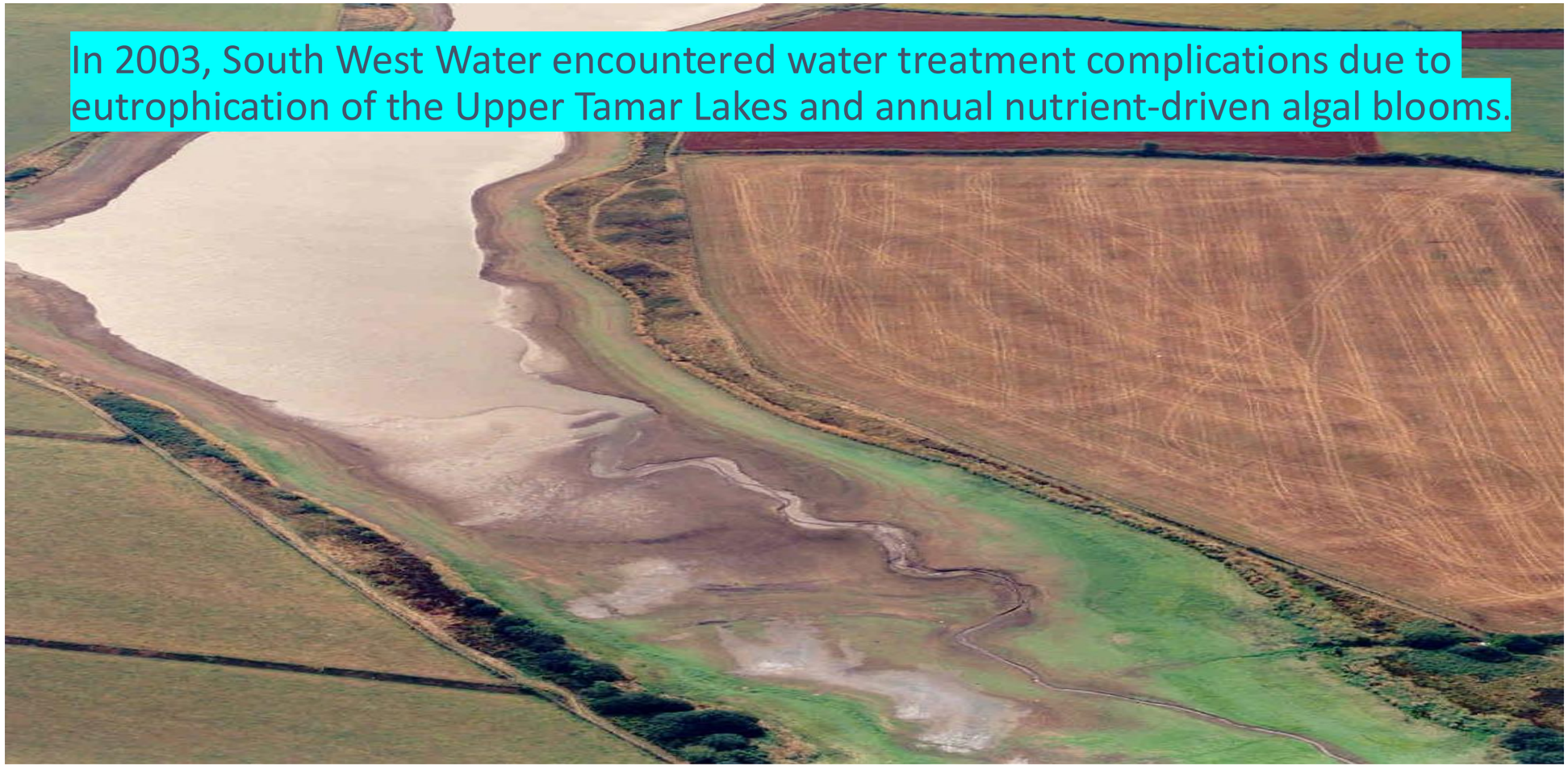
Upstream Thinking
By South West Water

South West Water



In 2003, South West Water encountered water treatment complications due to eutrophication of the Upper Tamar Lakes and annual nutrient-driven algal blooms.

We started discussing these issues with the Westcountry Rivers Trust, who agreed to run a pilot scheme on the Tamar…..

Farming derived drinking water catchment issues in the SW

Upstream Thinking
By South West Water

South West Water

Pilot Projects: (2003-10)

UST1: £9m (2010-15)
UST2: £10.5m (2015-20)
UST3: £14.5m (2020-25)
UST4: tbc

Partnership delivery of:
- Upland Headwater Restoration
- Farm advisory services and grants

Improving **water quality** and **storage** in the landscape

Upstream Thinking - focus on Catchment Resilience

South West Water WaterFuture

- Reducing soil, sediment, nutrients and chemicals from farm sources entering water courses and therefore Drinking water sources
- Increasing natural resilience in catchments – habitat restoration and management
- Increasing upland resilience – peatland catchment restoration
- Natural flood risk management

Working with Natural Processes for sustainable and cleaner catchment flows

Upstream Thinking
By South West Water

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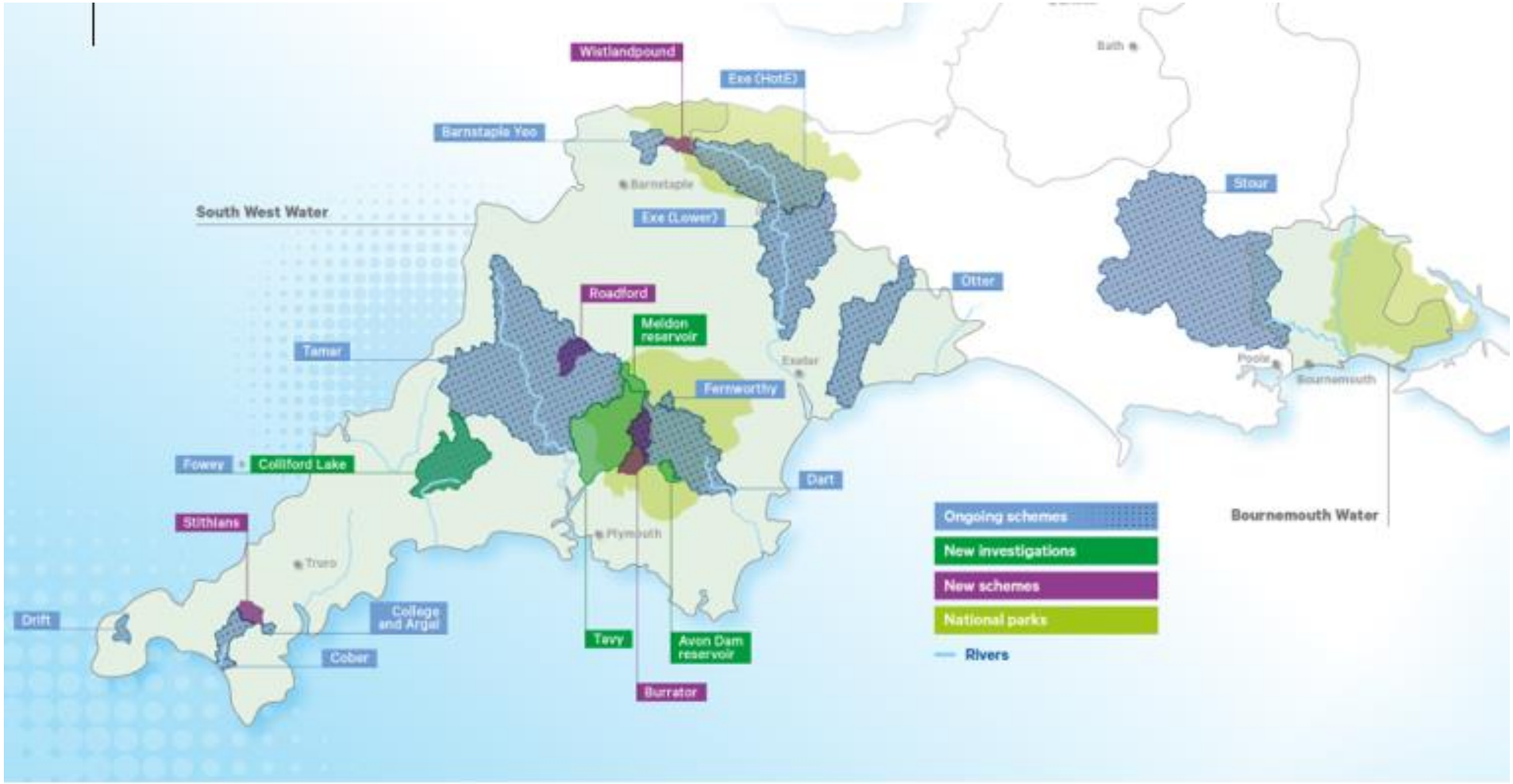

Upstream Thinking
Who and where?

Catchment interventions:

- Cornwall Wildlife Trust (CWT)
- Devon Wildlife Trust (DWT)
- Westcountry River Trust (WRT)
- South West Peatland Partnership (SWPP)
- Farming and Wildlife Group (FWAG)
- Catchment Sensitive Farming (CSF)

Monitoring and investigation:

- University of Exeter
- Project partners (within catchments)
- SWW (WTWs impact)
- South West Lakes Trust

1. River Exe- SWPP, FWAG, DWT/WRT
2. River Dart – WRT and DWT
3. River Tamar – WRT and DWT
4. River Fowey – WRT
5. Fernworthy - DWT
6. Barnstaple Yeo - DWT
7. Argal & College - CWT
8. River Cober – CWT
9. Drift –CWT
10. Stitians – CWT
11. Roadford – DWT/WRT
12. Wistlandpound -DWT and North Devon ELM's Trail
13. Burrator –SWLT and SWPP
14. Stour (Bournemouth) – CSF
15. Tavy GR (Green Recovery)
16. Dartmoor GR (Meldon, Teign)

EXE

SWPP FWAG
DWT WRT

TAMAR

DWT WRT

DART

DWT WRT

OTTER

DWT WRT

ROADFORD

DWT WRT

WISTLANDPOUND

DWT NDP

BURRATOR

SWPP SWLT

YEO

DWT

FOWEY

SWPP WRT

FERNWORTHY

DWT

ARGAL & COLLEGE

CWT

COBER

CWT

DRIFT

CWT

STITHIANS

CWT

STOUR

CSF

Upstream Thinking
By South West Water

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How does it work?

1. Contact farmer to arrange face to face visit

2. Discuss farm pressures and plans

   Discuss benefits of good farming

   Explain how we can help

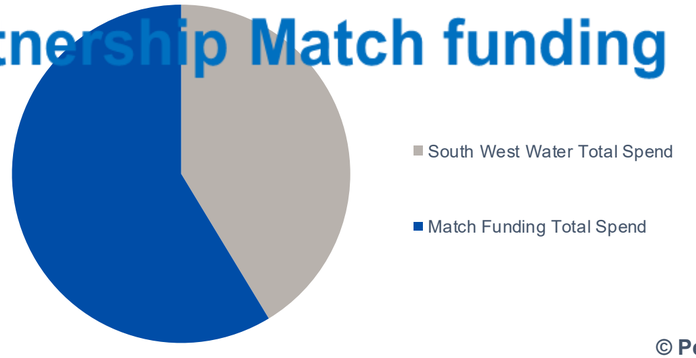
3. Brown and green advice

   Develop and agree farm plans

4. Support delivery of farm plan

- ✓ Farm Plans
- ✓ Area of land better managed

Partnership Match funding



Upstream Thinking: on farms
Low cost co-investments

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Direct Organic carbon and nutrient sources into rivers

Solved by simple investment

Upstream Thinking: on farms
High cost co-investments

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Potential DOC/pollution source

Complex Capital investment

Multiple output schemes:

Upstream Thinking
By South West Water

Catchment management for slow clean raw water supplies delivers multiple and integrated natural capital outcomes.

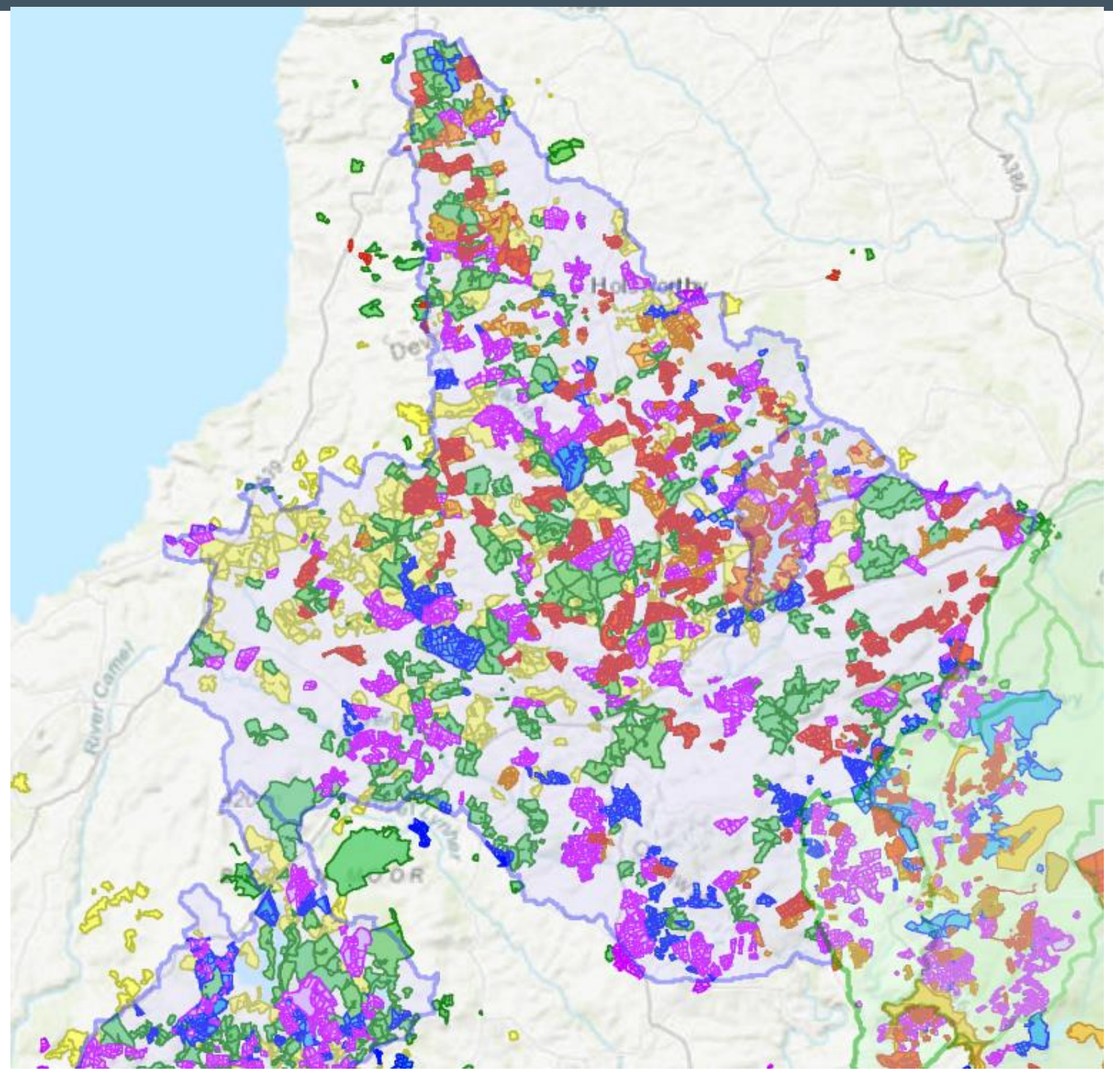
As well as the drinking water outcomes UST can help with:

- flood and CSO discharge risk reduction, through reduction of peak catchment flows in to urban areas
- Increased biodiversity (for habitats and species) and management of invasive species
- catchment nutrient and sediment loading reduction into bathing and shellfish waters
- carbon storage
- increased catchment base flows for more dilution and resilience in rivers

Natural Capital Outcomes

Upstream Thinking
By South West Water

Upstream Thinking Delivery in the River TAMAR catchment by WRT



Catchment delivery 2020-25:

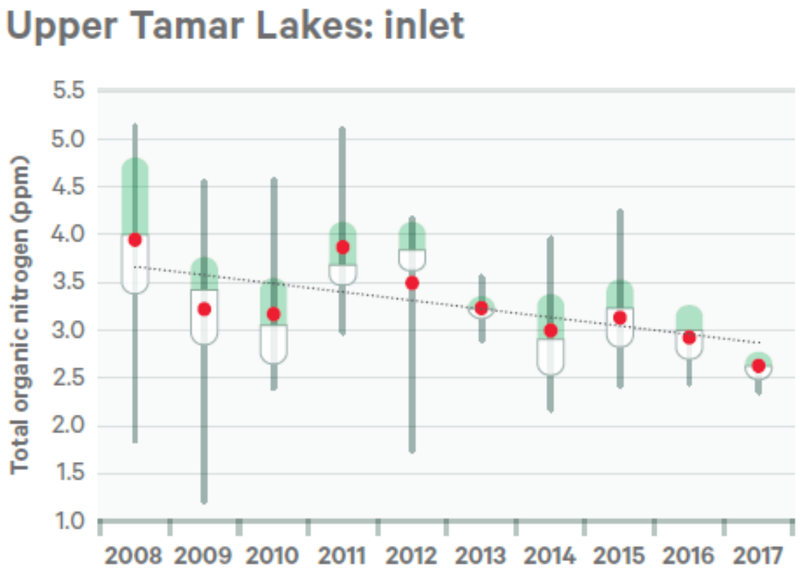
Delivered a total of 11,328 ha of land into active management since 2020

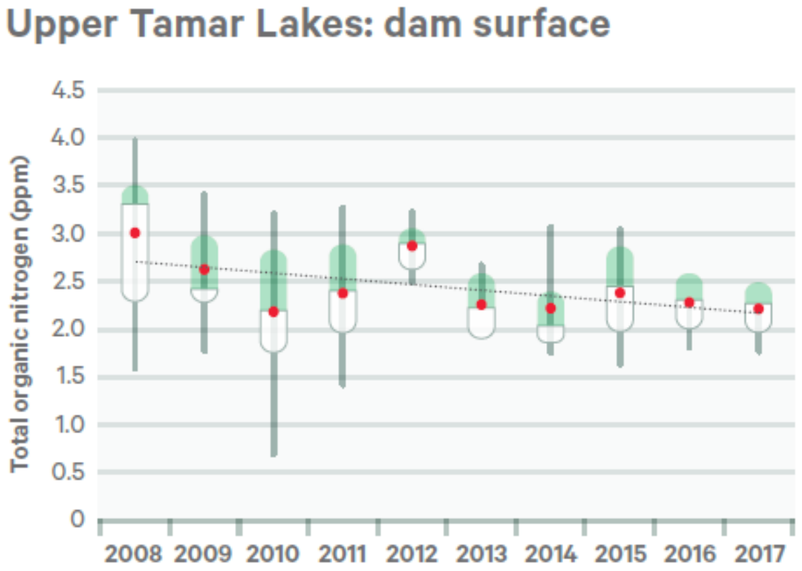
*65 ha of new permanent habitat
*44 ha of habitat restored
*248 farms visited
*172 farms advised.

~15k trees planted.

- WRT Active Area
- DWT Active Area
- DWT Engaged Area
- WRT Engaged Area
- UST2 WRT Farms
- UST1 WRT Farms

Has this investment had an impact?



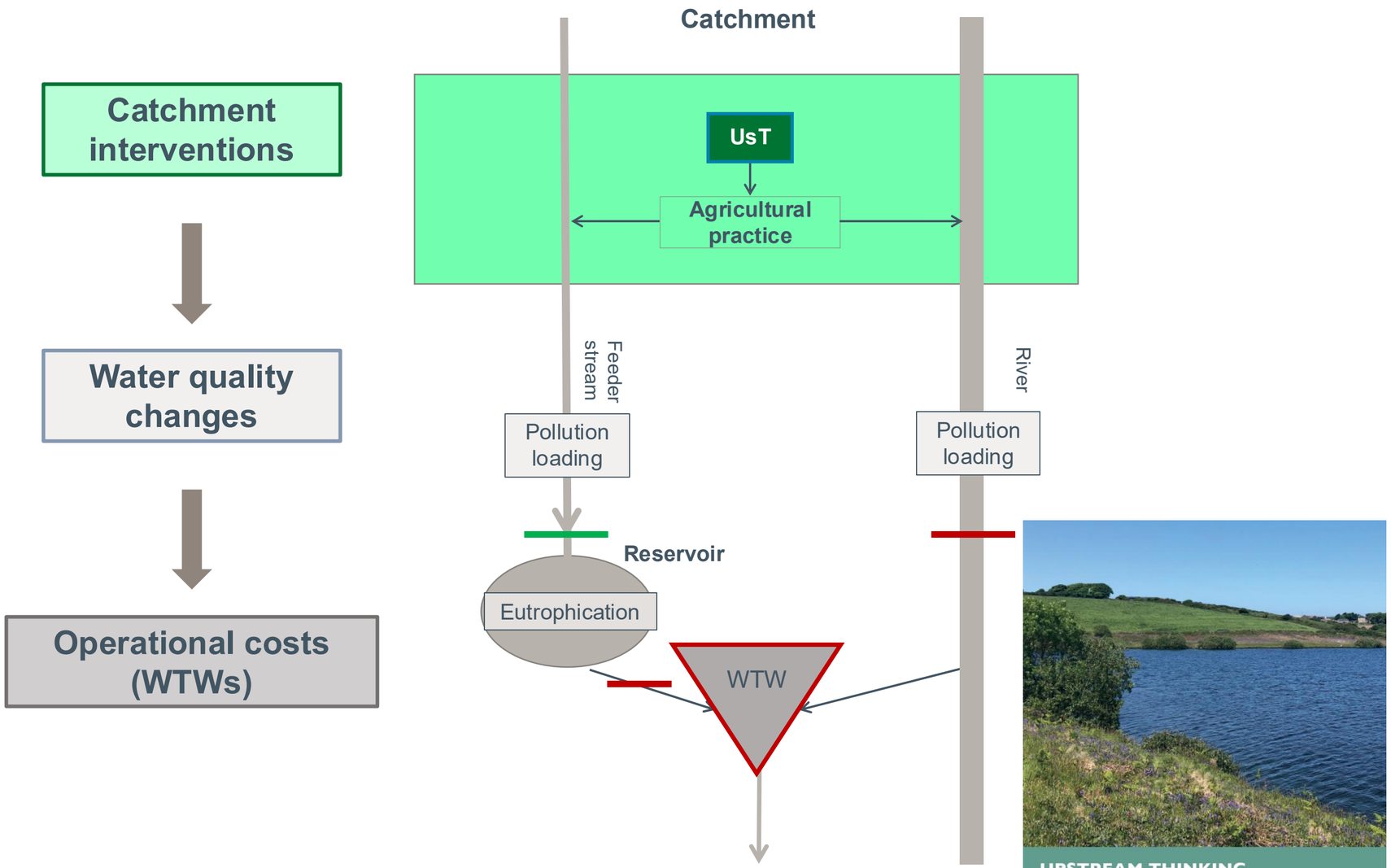


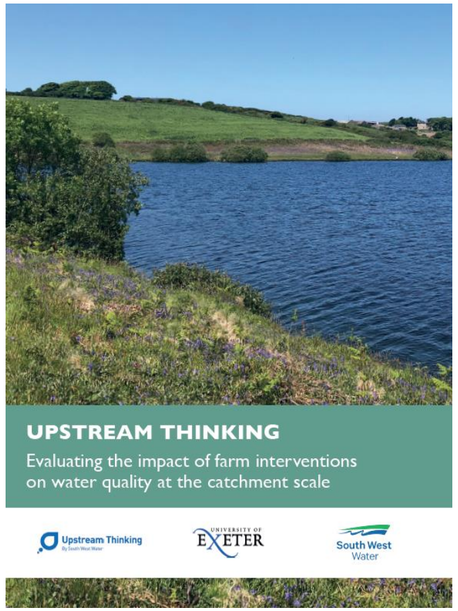
The Environment Agency took samples at Buse's Bridge (at the inlet to the Upper Tamar Lakes) where, from 2008 to 2017, they measured for total oxidised nitrogen.

In the same period, total nitrogen levels were also recorded at the surface of the lake.

Both inlet and outlet nitrogen data show reductions since 2008 that coincide with the implementation of the catchment management initiative.

Investigation of WTW impacts by the Uni of Exeter





UoE quantification using data from project partners
UoE investigation using SWW data
In situ monitoring and data collection by UoE

Upstream Thinking: on the moors
Restoration of peatland hydrology

South West Water

South West Peatland Partnership

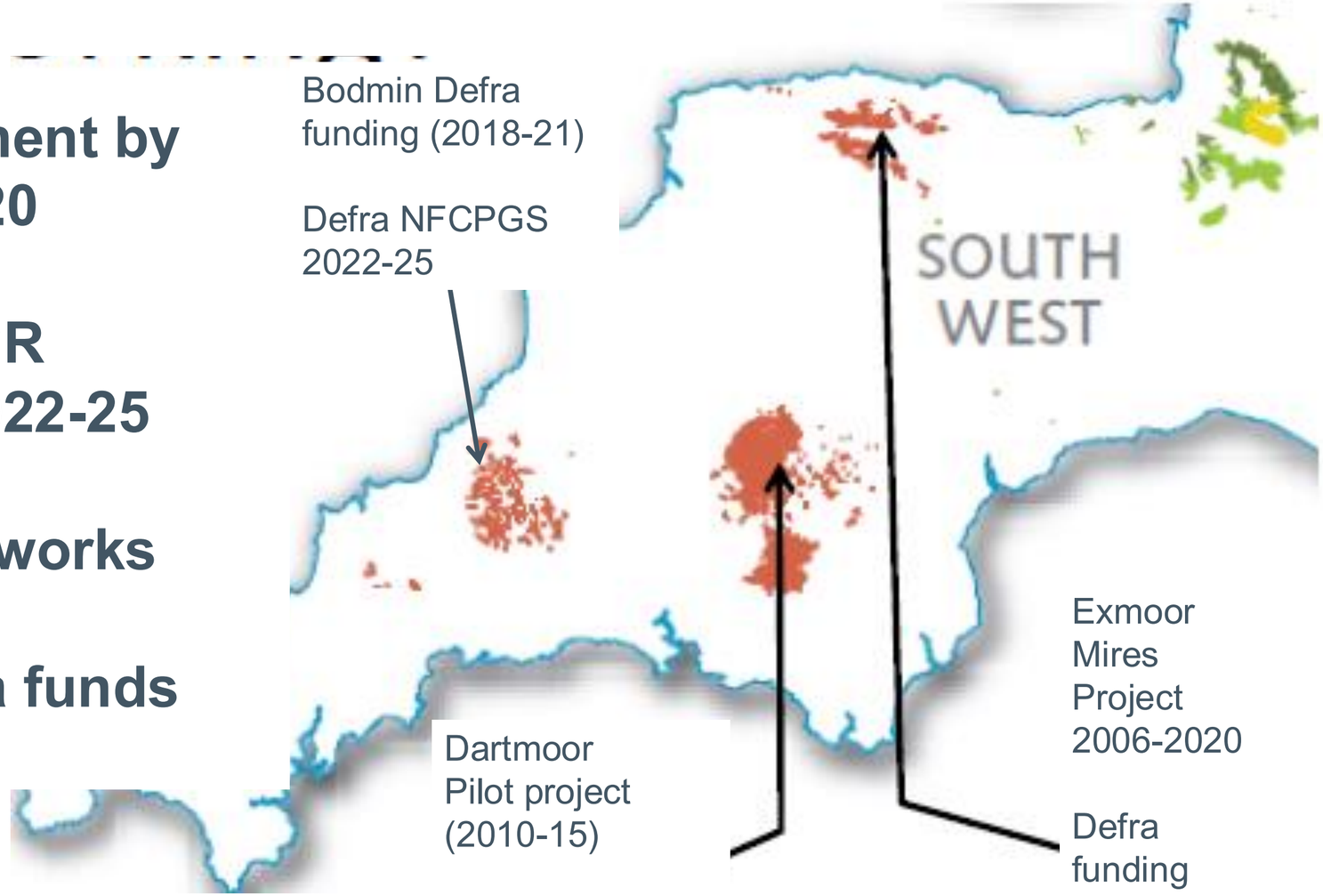
SW Peatland Partnership Projects

£5m investment by SWW 2006-20

£6m SWW GR Dartmoor 2022-25

+NE capital works

£2+9m Defra funds



Bodmin Defra funding (2018-21)

Defra NFCPGS 2022-25

Dartmoor Pilot project (2010-15)

Dartmoor Defra funding (2018-21)

Defra NFCPGS 2022-25

Exmoor Mires Project 2006-2020

Defra funding (2018-21)

Defra NFCPGS 2022-25

South West Peatland Partnership

Wooden block construction, and peat covering the wooden blocks.

Tavy Head, Dartmoor

South West Water

South West Peatland Partnership

And finally……

A special thank-you from our beneficiaries!!!

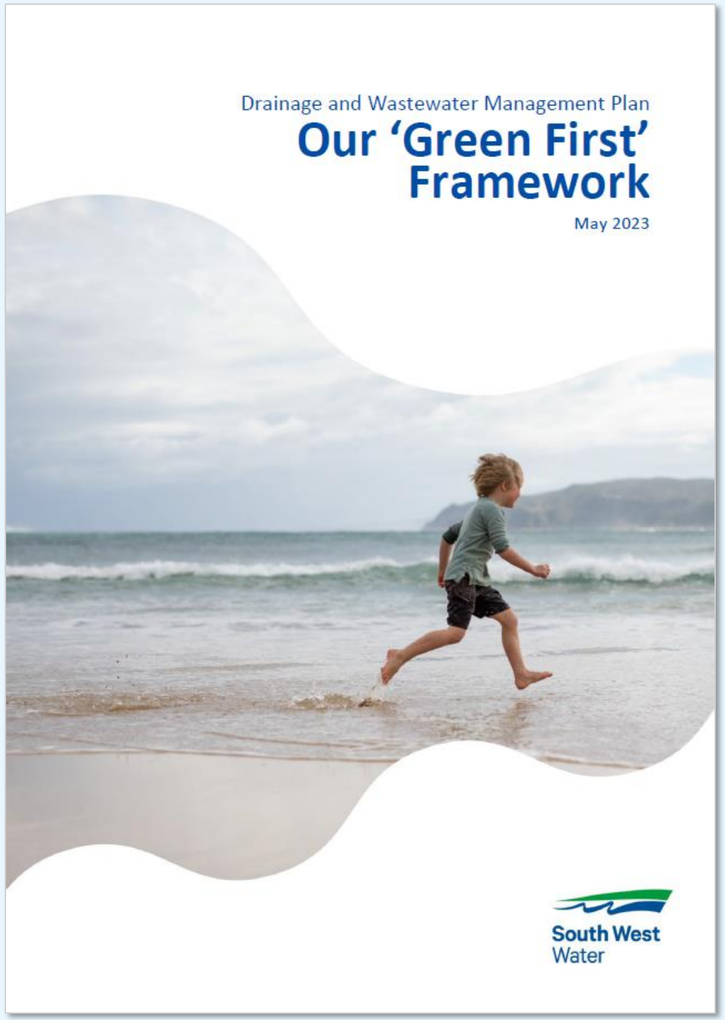
Restoring resilient natural catchments taking a ‘Green First’ approach

Nick Paling &
Izzy Atkins-McIlwaine

Engagement & Collaboration
- Green First & NBS

South West Water
Bournemouth Water
BRISTOL WATER

Our ‘Green First’ framework…



Decision-framework to support selection of right blend of solutions:

1. Urgency
2. Certainty
3. Deliverability
4. Affordability
5. Operability
6. Multi-capital benefits

South West Water
Bournemouth Water
BRISTOL WATER

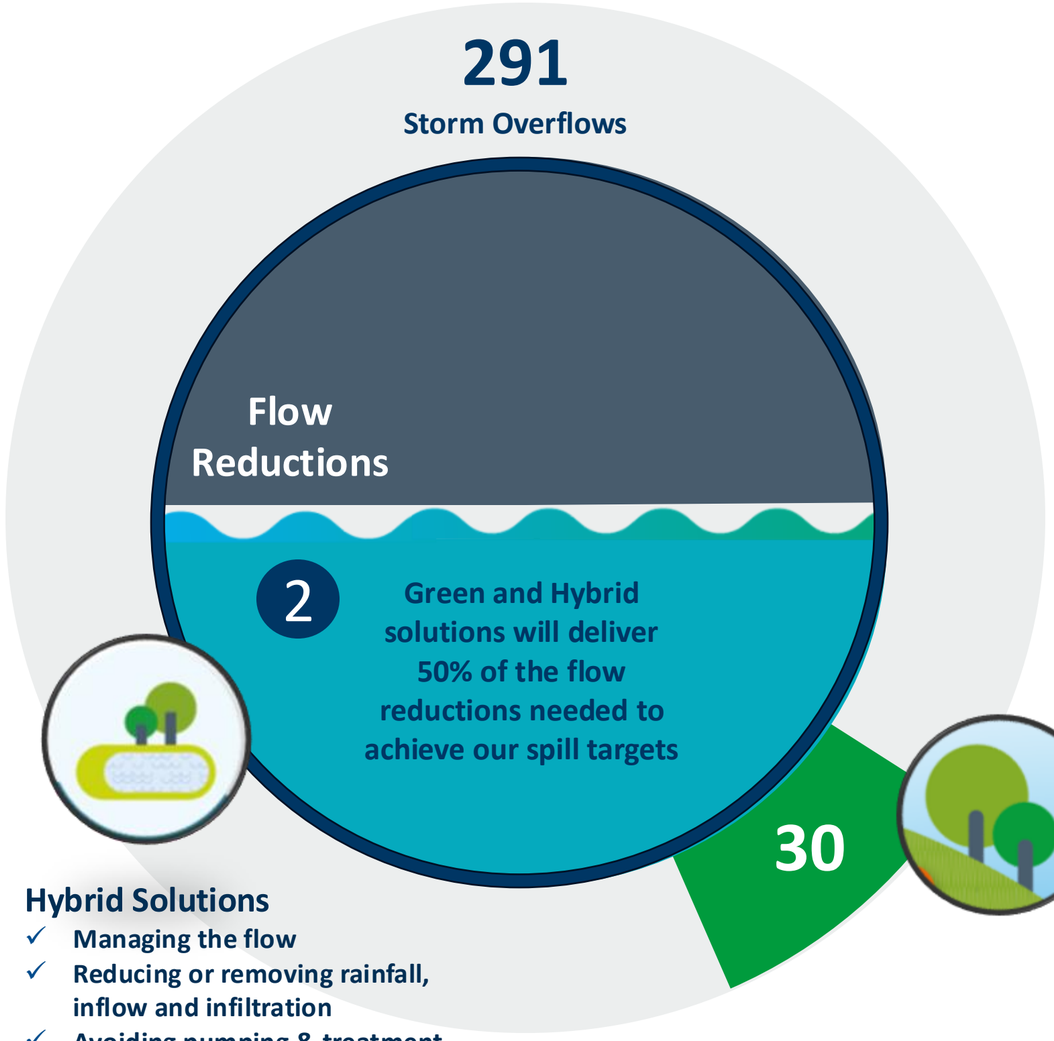
Our Targets for Green First

South West Water

AMP8 Storm Overflow Programme

Decision-making Framework

1 **We'll triage our full AMP8 programme to look for opportunities to deliver green & hybrid solutions**



3 **We'll demonstrate Green solutions at 30 overflows in AMP8**

Hybrid Solutions
- ✓ Managing the flow
- ✓ Reducing or removing rainfall, inflow and infiltration
- ✓ Avoiding pumping & treatment

Green Solutions
- ✓ Slowing the flow
- ✓ Ecologically-driven processes
- ✓ Wider benefits for people & place

South West Water

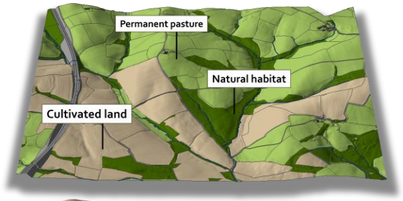
We can only use NBS effectively if we understand the problem…

…and we know how to target, design and deliver them effectively

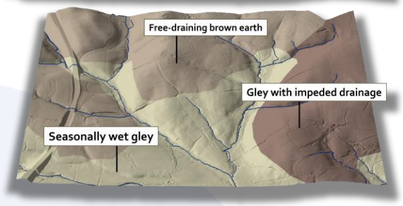
Natural water system

Structure and function

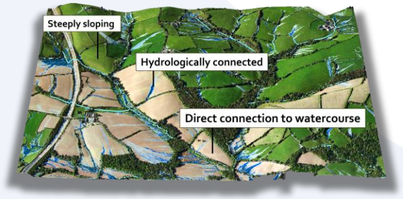
The natural water system involves the continuous cycling of water through processes like evaporation, condensation, and precipitation, maintaining the Earth's water balance.



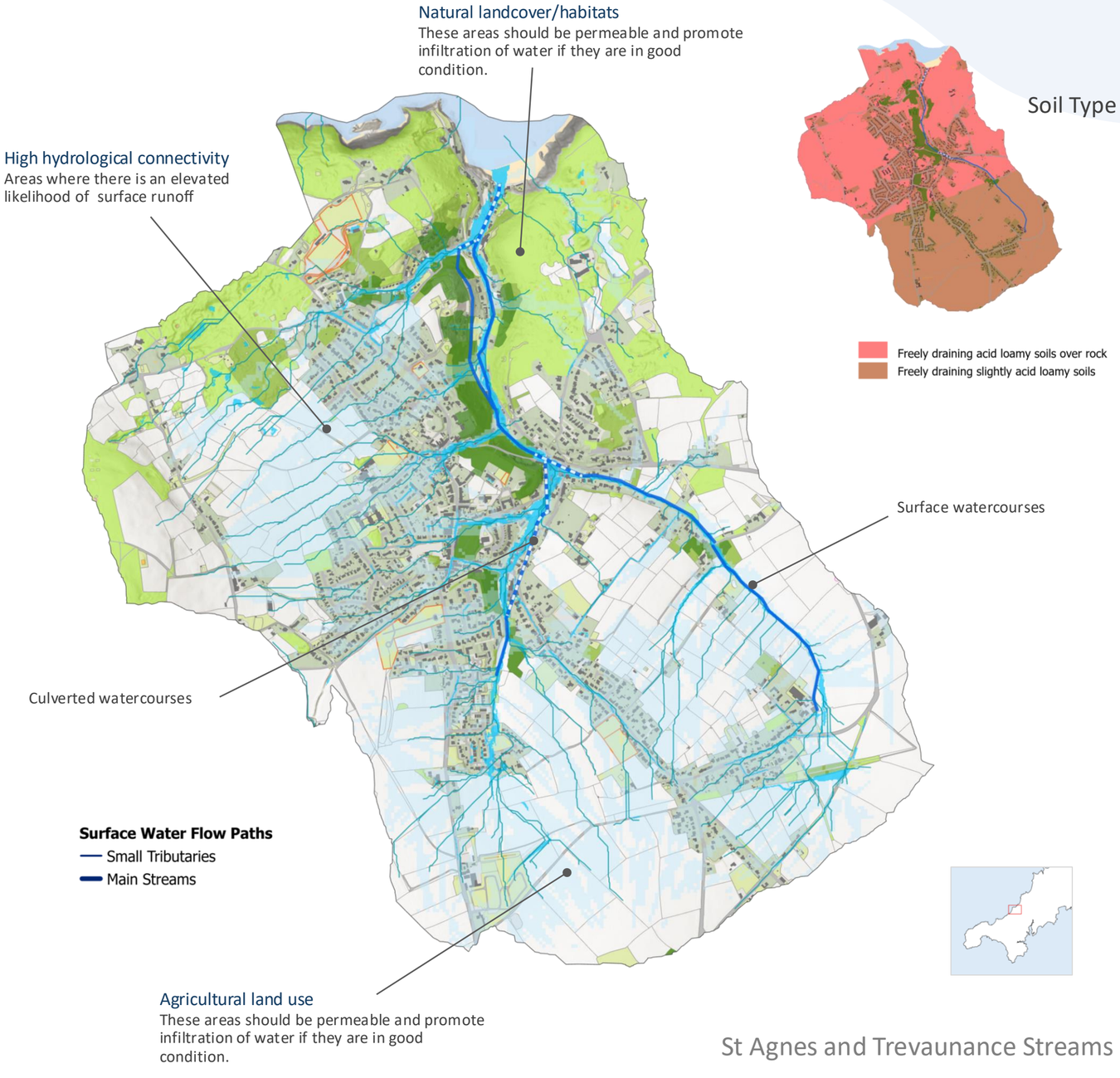
Landcover / Land use



Soil character and health



Hydrological connectivity



St Agnes and Trevaunance Streams

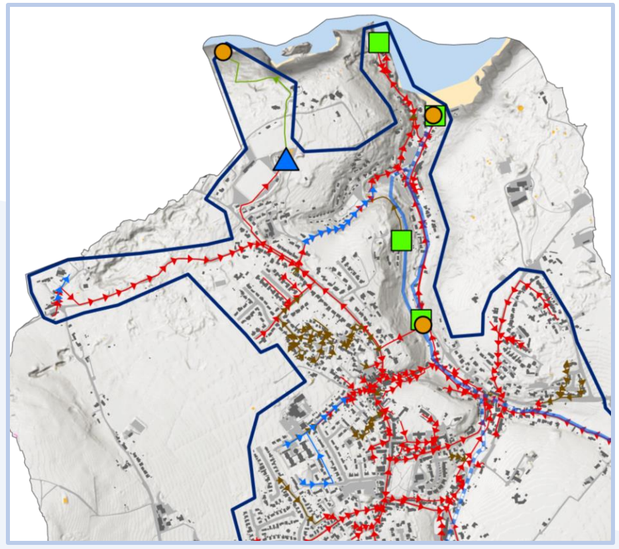
Human water system

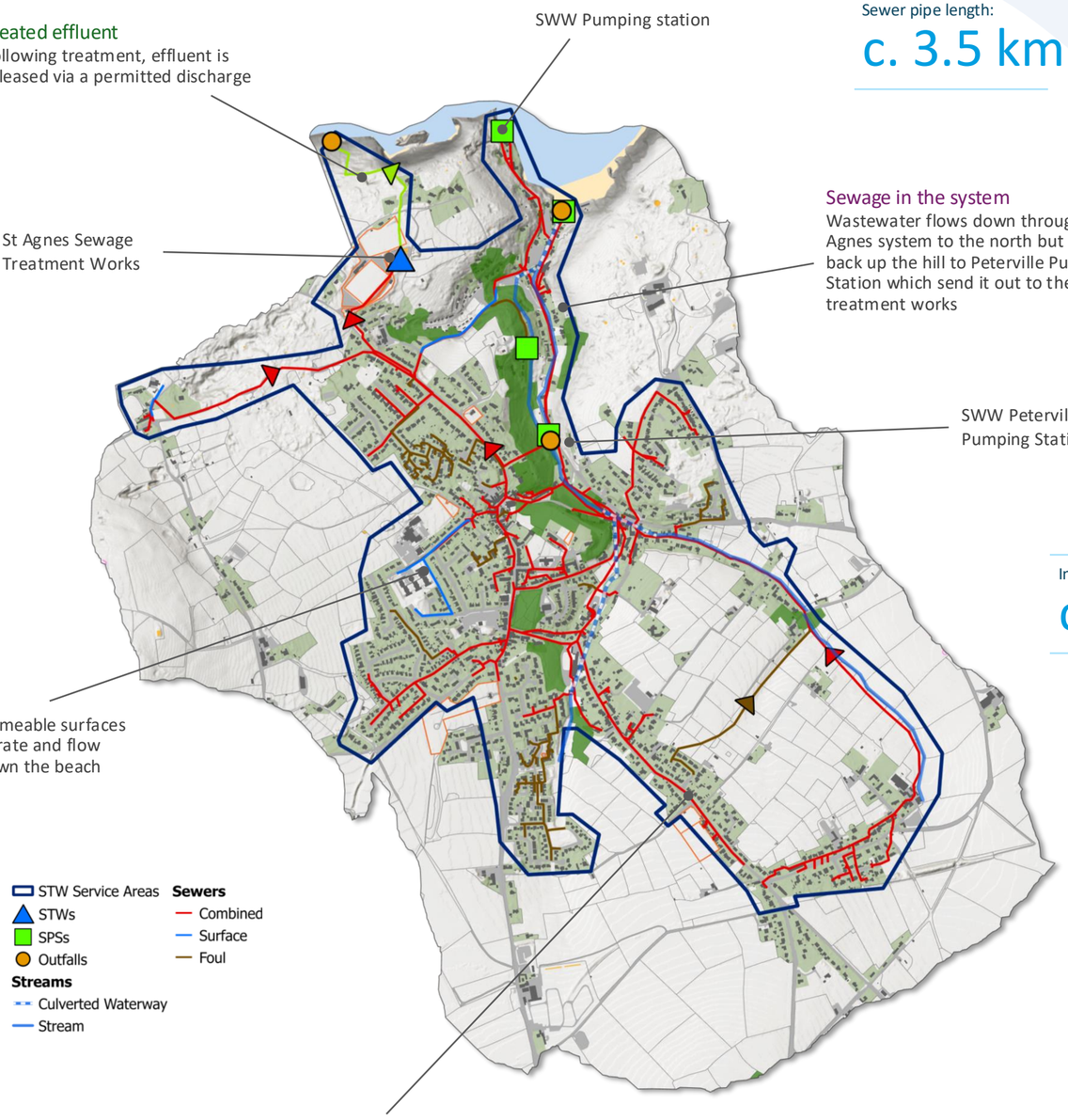
Structure and function

The human water system involves the management, distribution, and use of water resources by societies.

It includes activities such as water extraction, treatment and distribution for domestic, agricultural, and industrial purposes, and drainage and wastewater treatment and management.

More detailed view of the drainage and sewerage network in St Agnes





Sewer pipe length:

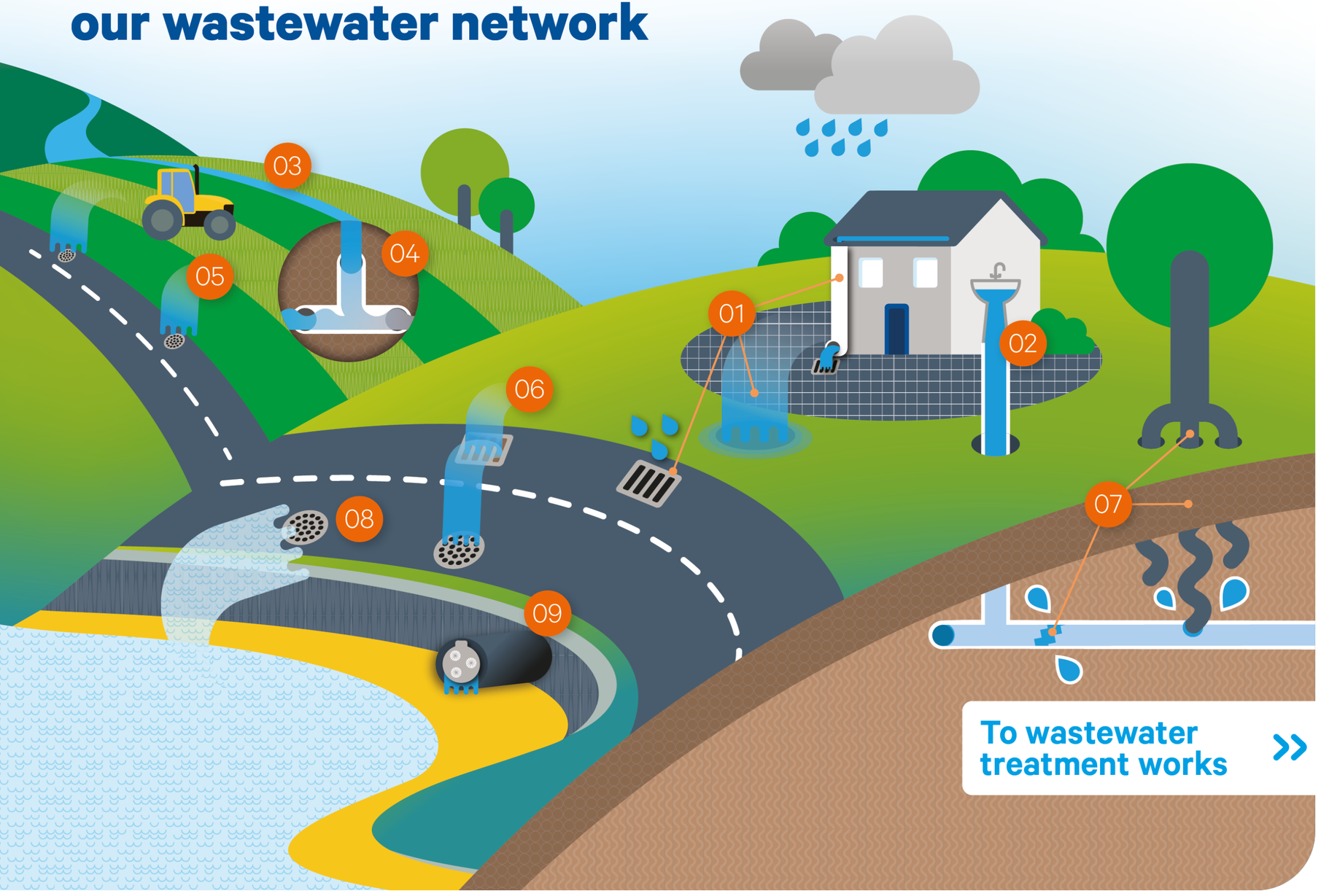
c. 3.5 km

Impermeable area:

c. 3 Ha

St Agnes and Trevaunance Streams

Types of flow that can enter our wastewater network



Planned surface water

01 Runoff from roads and roofs in built up areas enters combined sewers

Foul flow

02 Wastewater from homes and businesses enters the foul and combined sewers

Inflow

03 Rivers, becks and streams that enter the combined sewer network

04 Land or surface water drainage misconnected into the foul and combined sewers

05 Water running off surrounding fields and entering the combined system through manholes

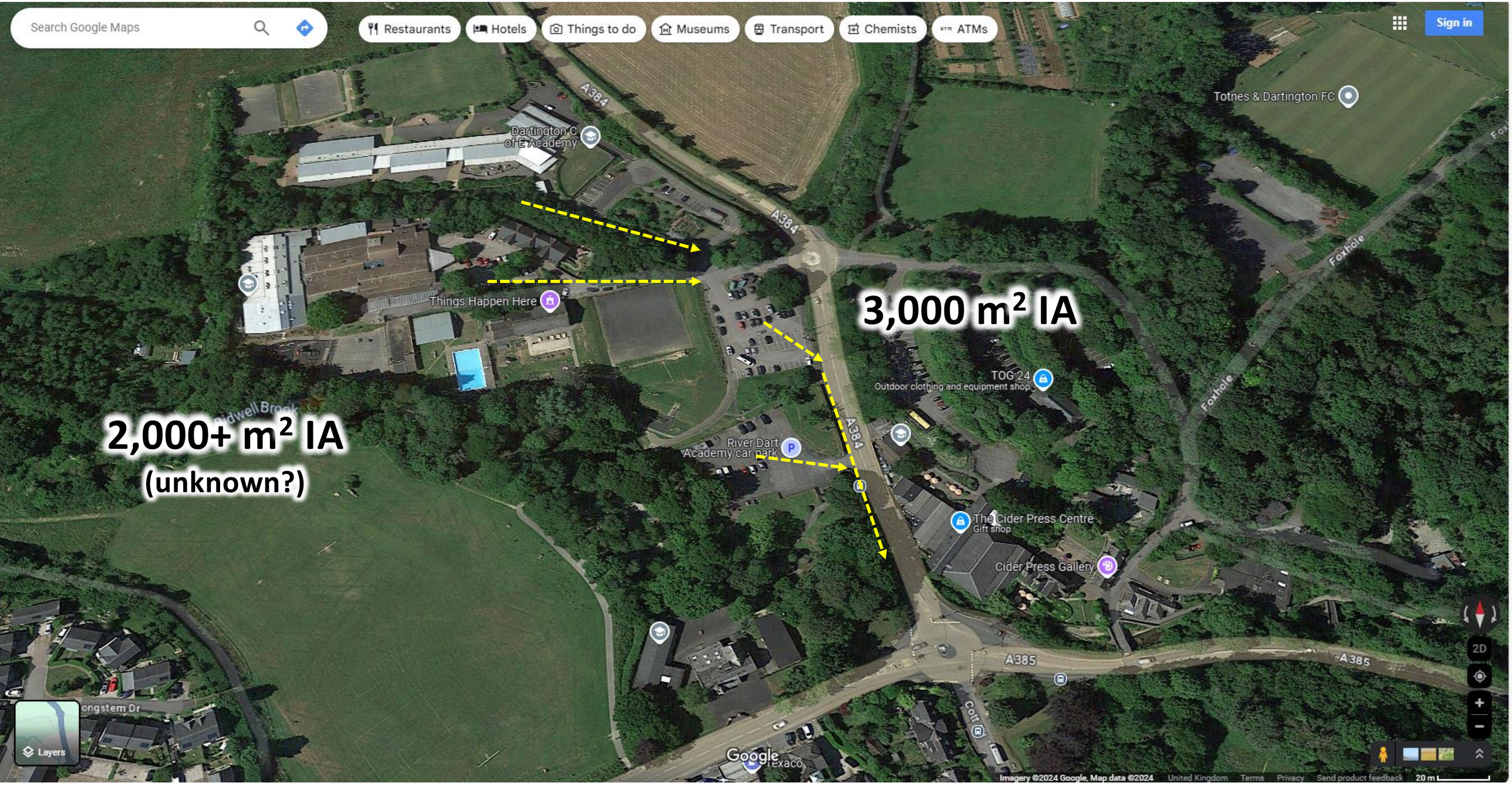
06 Other surface water systems exceeding capacity and entering the foul and combined sewers

Infiltration

07 **Groundwater** seeps through cracks and joints in sewers from ground movement, root growth and pipe condition

08 **Seawater** enters during high tides through drains, gulleys and unsealed manhole covers

09 **Seawater** enters through damaged tidal flaps or pipework from coastal erosion, limpets or barnacles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Things Happen Here
3,000 m² IA
TOG 24
Outdoor clothing and equipment shop
Foxhole
River Dart Academy car park
2,000+ m² IA
(unknown?)
The Cider Press Centre
Gift shop
Cider Press Gallery
A385
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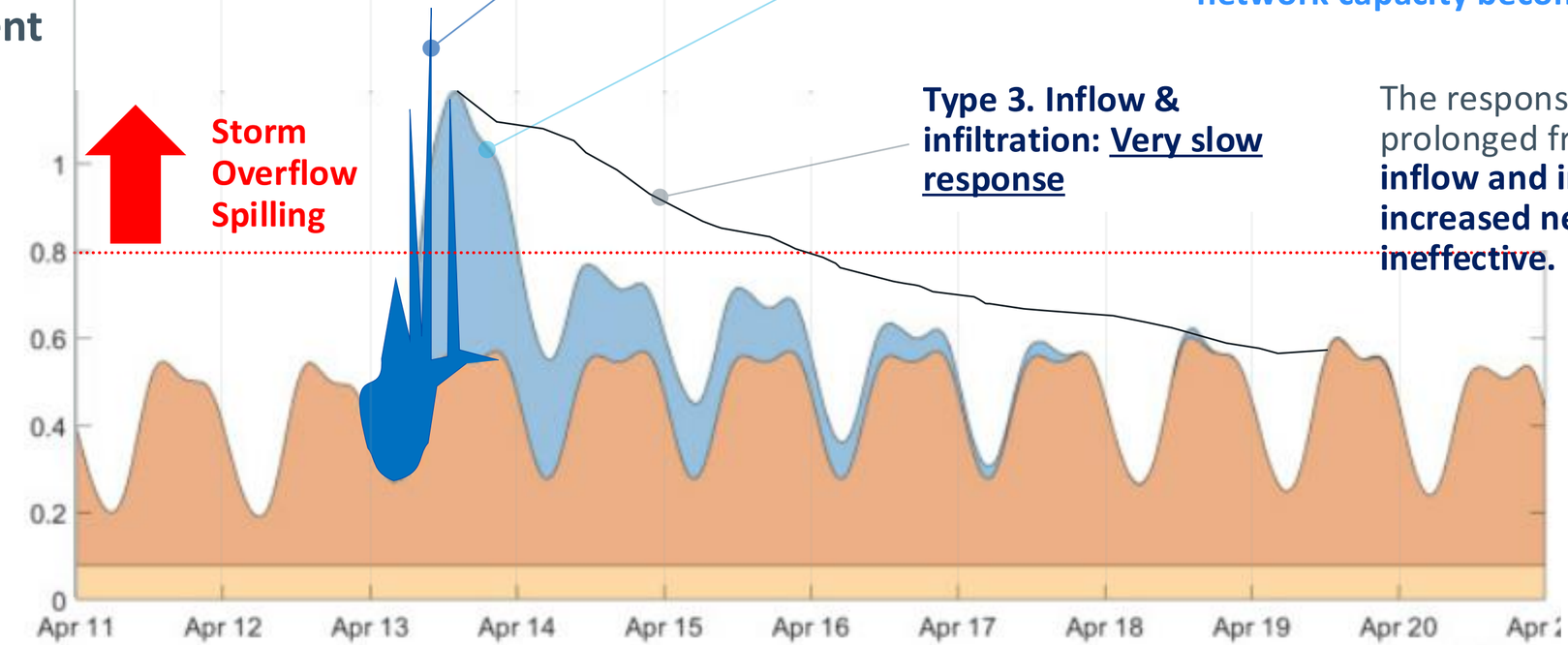
We need to understand the impacts of inflow & infiltration on SO spills

Rainfall hyetograph

Rainfall event occurs

Impact on wastewater catchment flow

Storm Overflow Spilling



Type 1. Planned inflow: Urban/Rapid response The wastewater catchment reacts to the rainfall quickly, mirroring the rainfall pattern. Runoff from roads and roofs flows into the sewerage network. **Storage in catchment can typically manage this flow and prevent spills**

Type 2. Unplanned inflow: Slow response A slower and more prolonged flow enters the sewerage network and takes longer to reach the treatment works. **Elimination or reduction of flows is preferred. Increasing network capacity becomes less effective.**

Type 3. Inflow & infiltration: Very slow response The response varies seasonally and can be prolonged from days to months. **Reducing the inflow and infiltration is key to preventing spills, increased network capacity including storage is ineffective.**

Understanding storm overflows – how much water?

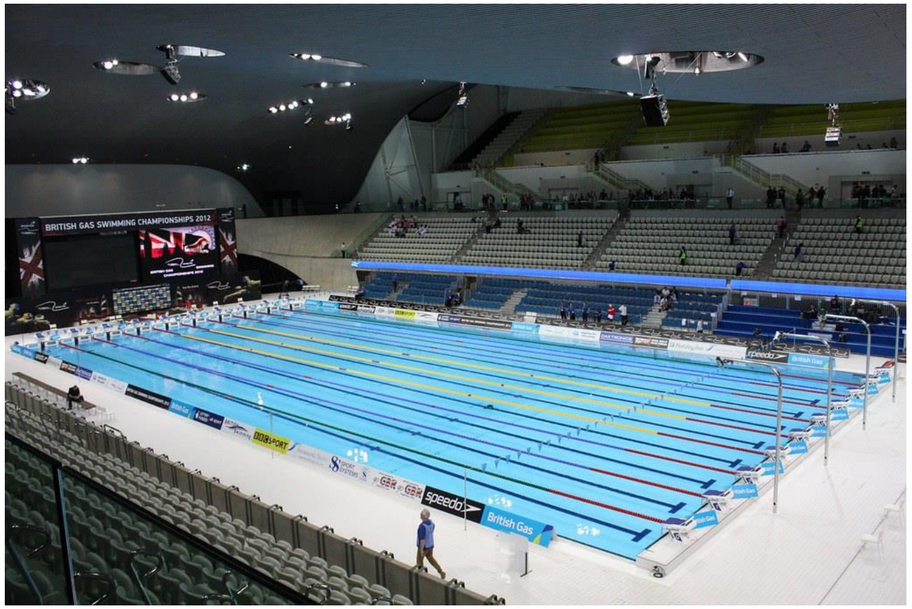
To reduce storm overflow frequency to 10 spills per annum for the 4 SO's the current estimated surface water removal required is…

Present day (2022) SW removal needed = **2,927m³**

~1.2 Olympic sized swimming pools

Predicted future (2050) requirement - including planned developments and climate change = **4,442m³**

~1.8 Olympic sized swimming pools



Solutions designed to meet the 10 spills per annum requirement will also achieve the 1 spill per Bathing Season requirement for SOs close to BWs

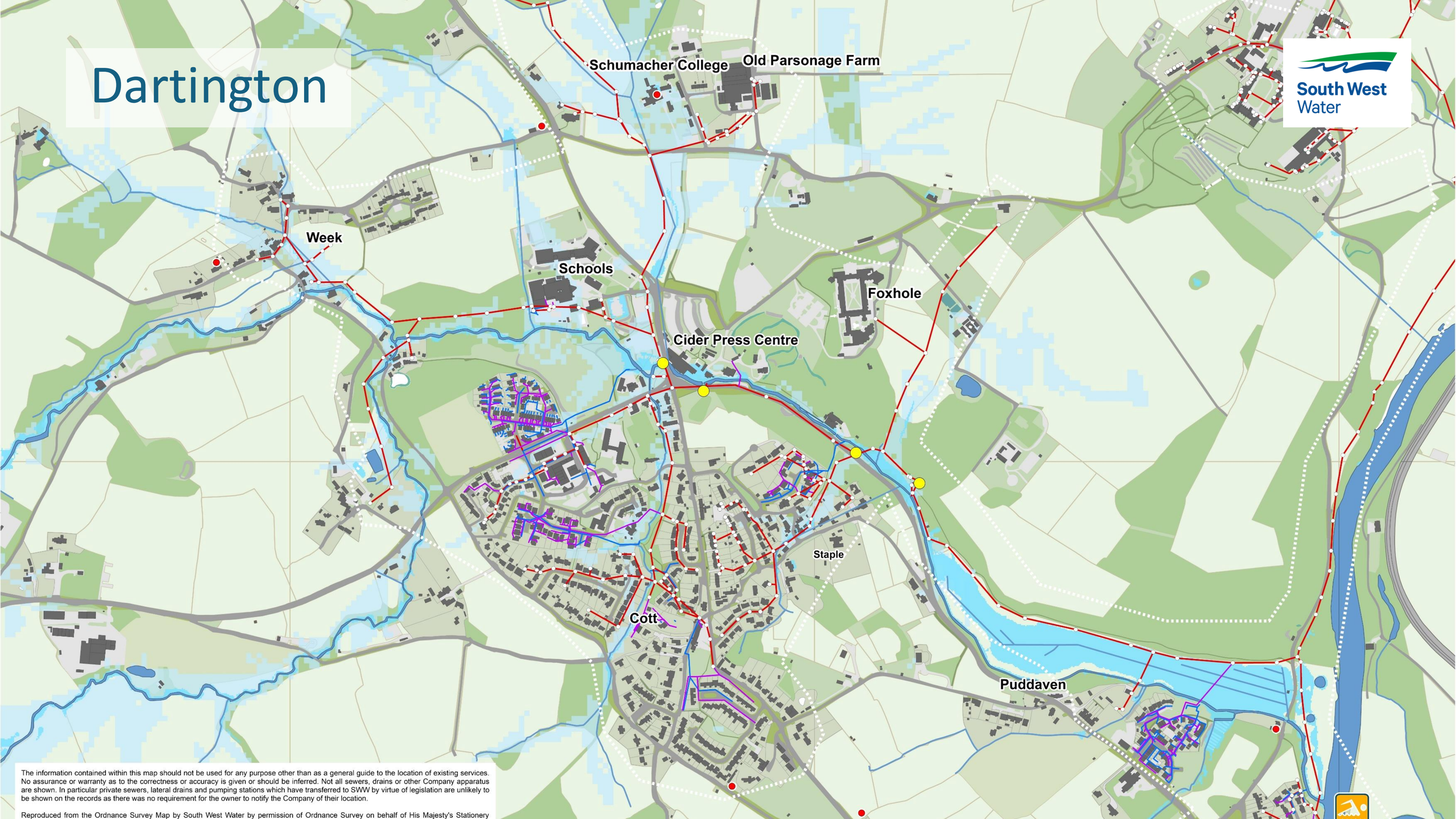
Natural Catchment Management Plans

15 pilot catchments across Devon & Cornwall

Split into 3 broad categories –

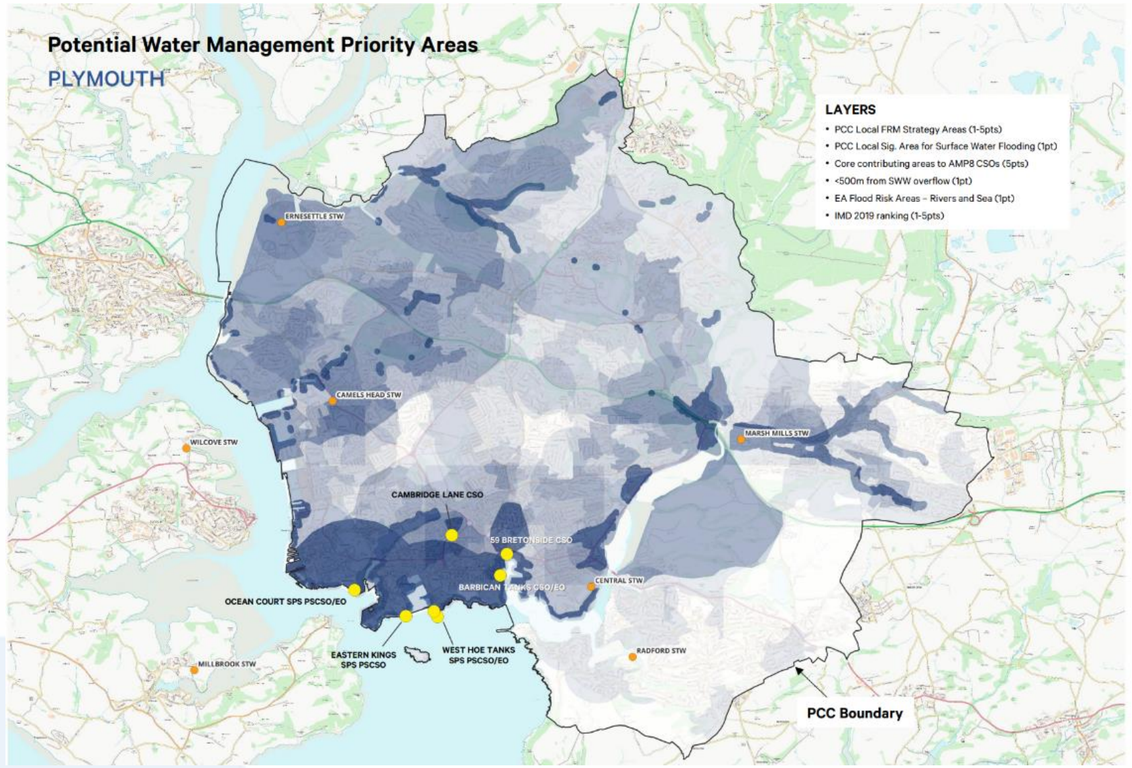
1. Coastal streams associated with bathing waters
2. River catchments with complex water management challenges
3. Streams and surface water in urban landscapes

Dartington



South West Water

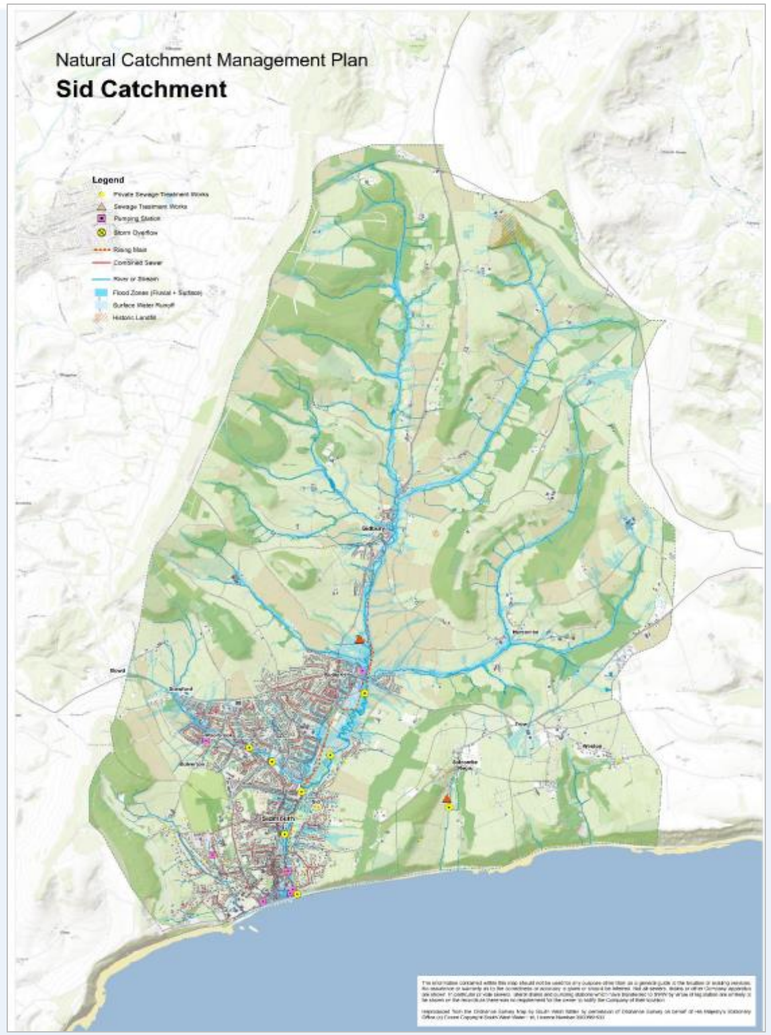
Plymouth

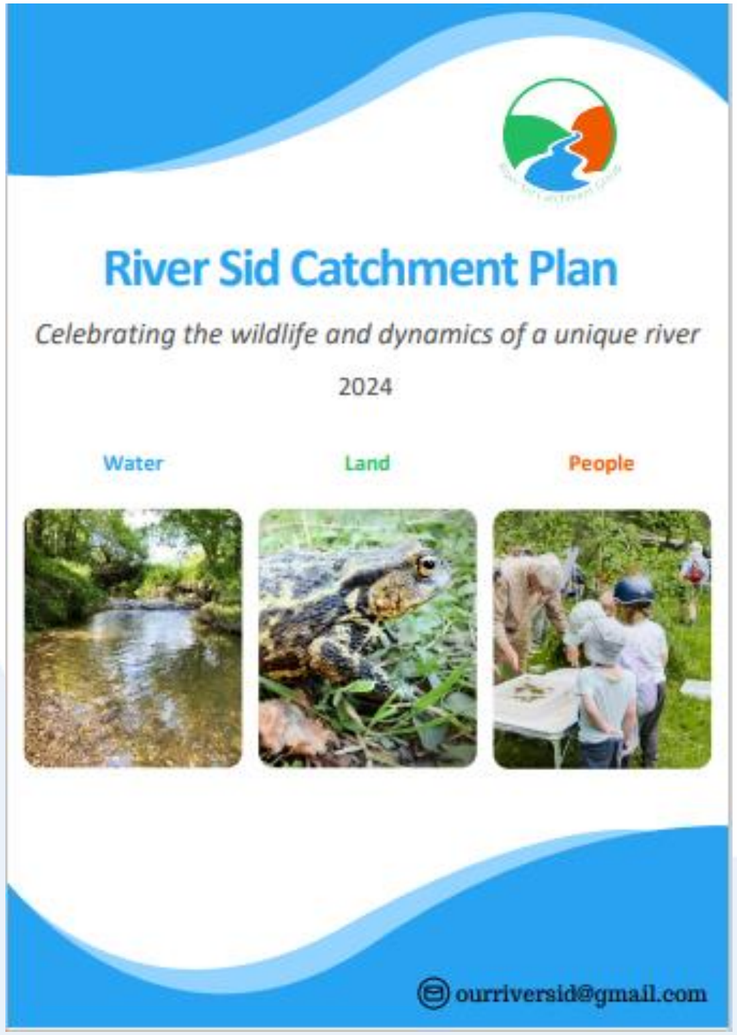


- MoU between South West Water, Environment Agency and Plymouth City Council
- Collaborative working
- A Green First Approach

South West Water

Sidmouth: Natural Catchment Management Plan





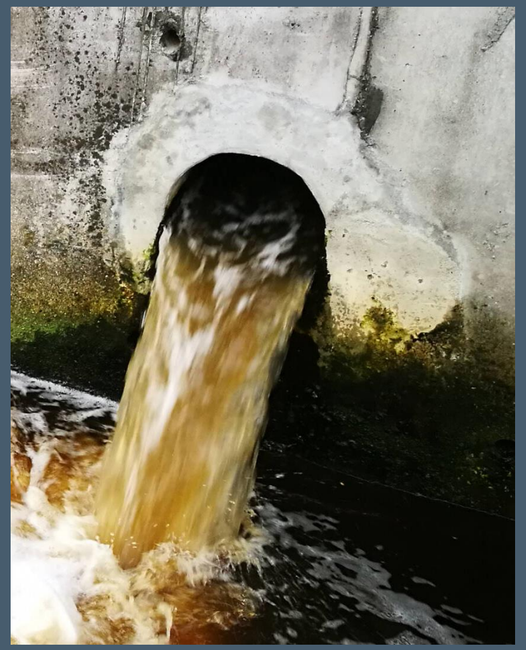
St Agnes

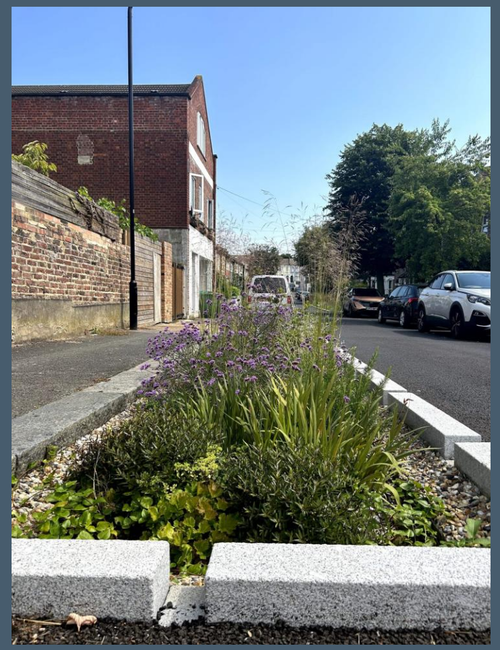
https://youtu.be/gJ58TuM4pnA

Ongoing projects and Next Steps

- Natural Catchment Management Plans – River Yealm, St Agnes, Sidmouth, Lympstone and more…
- Boundary Boost - Dartmoor Hill Farm Project. To incentivise, inform and reward good practice on farm hedgerows and boundaries.
- Water Net Gain – Ofwat Innovation Fund
- Establishing our partnership approach with Amplify…

Delivering Green First in Storm Overflow Projects





South West Water

Green First – Embedded, Not Added On

Green First should be part of how we design – not an add-on.

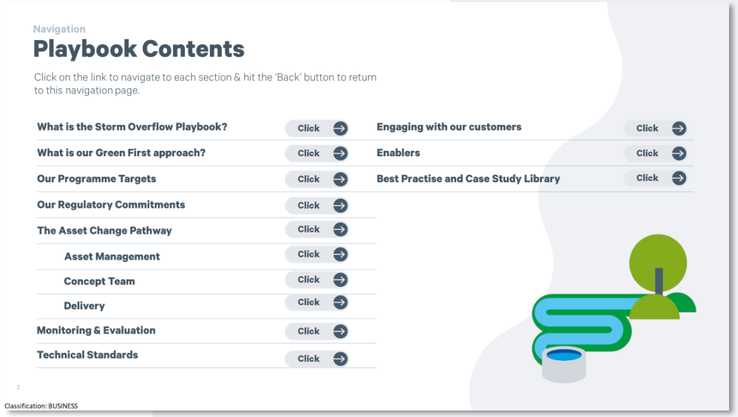
NbS considered for every site.

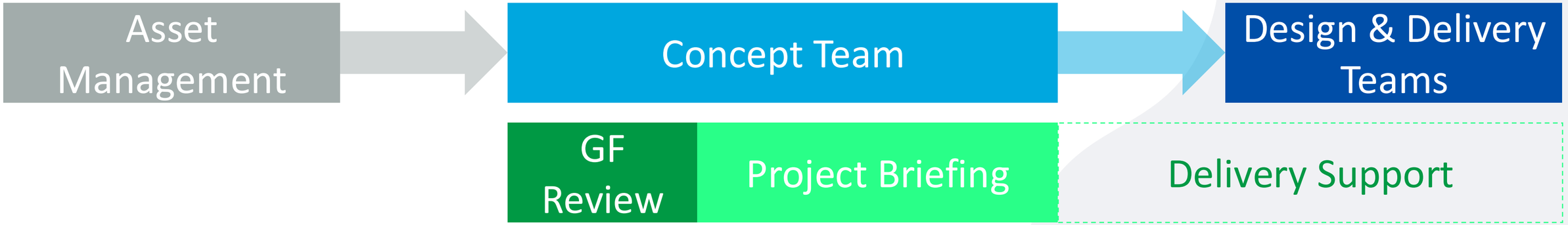
Burden of evidence on NbS not being viable.

- Why NbS ideal for Storm Overflows…
  - *Separation of rainfall runoff from the sewers is essential*

Embedding GF within the Delivery Pathway

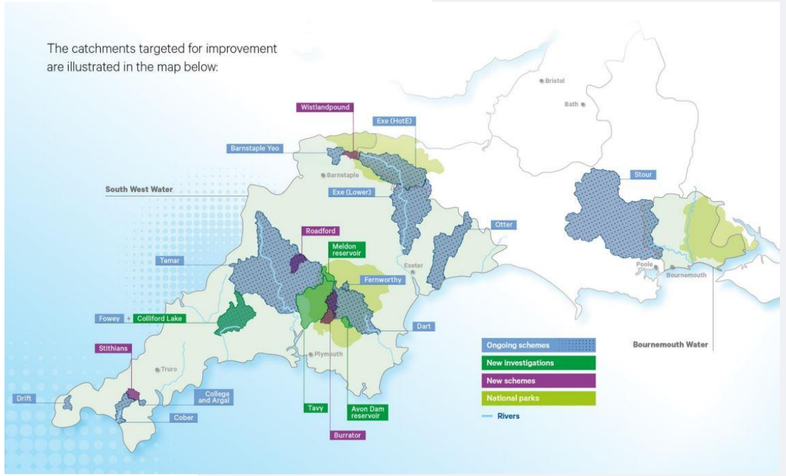
- Operate a **GF Playbook for Storm Overflows**.
- GF review is a **core stage** in the development process.
- All new projects pass through a **high-level GF screening**.
- Focus areas include:
  - *Identifying physical and collaborative opportunities*
  - *Ensuring development approach compatible with assessing the viability of NbS*
  - *Informing option selection from the earlier stage*

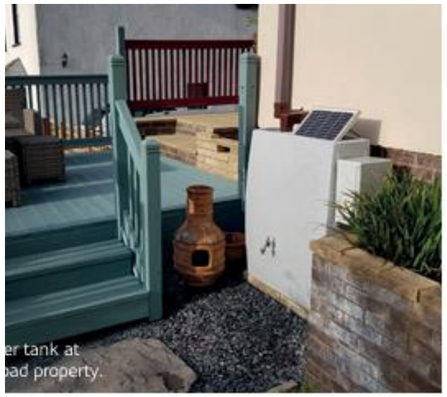




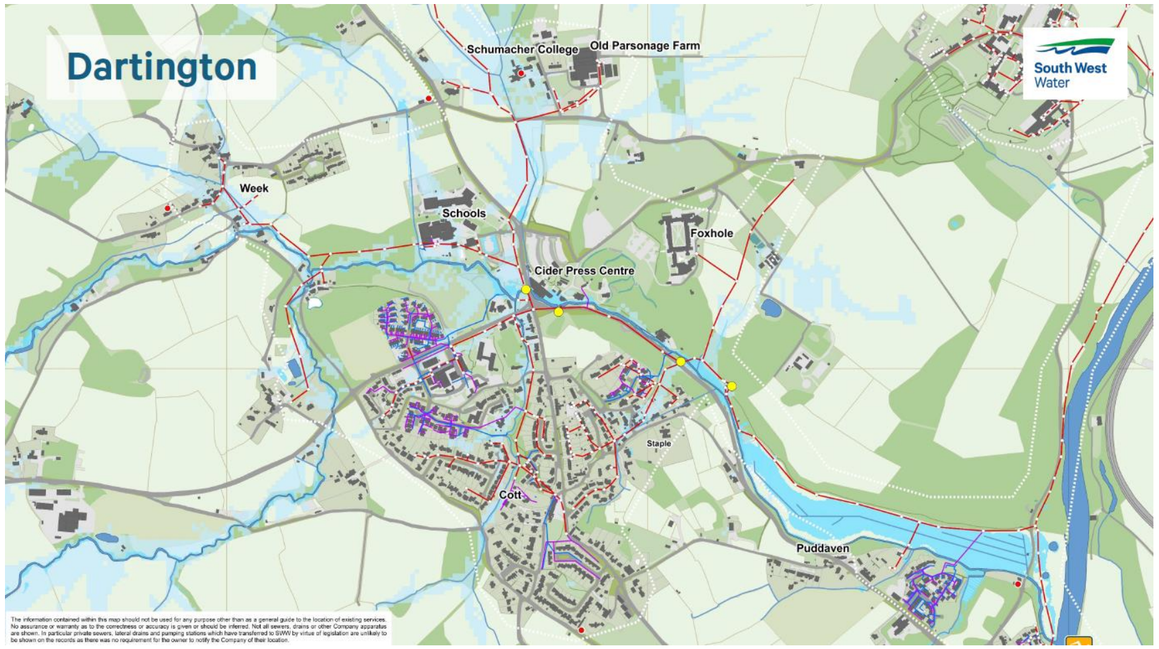
Building a Tactical Programme of Opportunities

- Ongoing review of wider SO programme to:
  - *Identify high-value opportunities to bring forward*
  - *Align with other programmes like Upstream Thinking*
  - *Promote collaboration across teams and delivery areas*
  - *Demonstrate our green capabilities across different NbS solution approaches*
- ***The aim:** early starts in AMP8 = more time, more value, better outcomes*

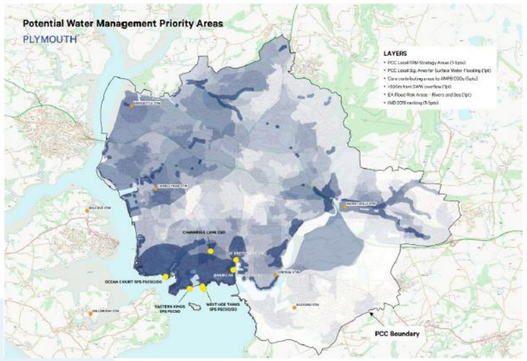




Green First Demonstrator Projects



Plymouth



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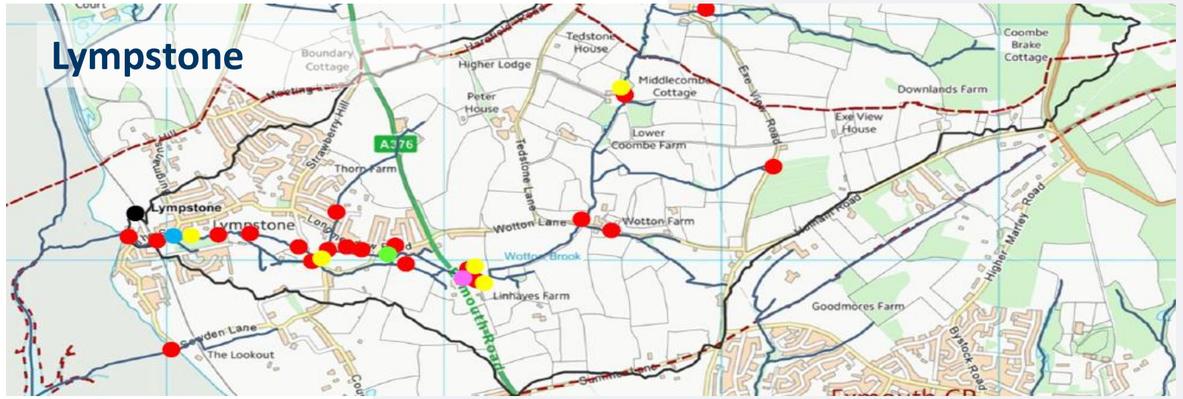
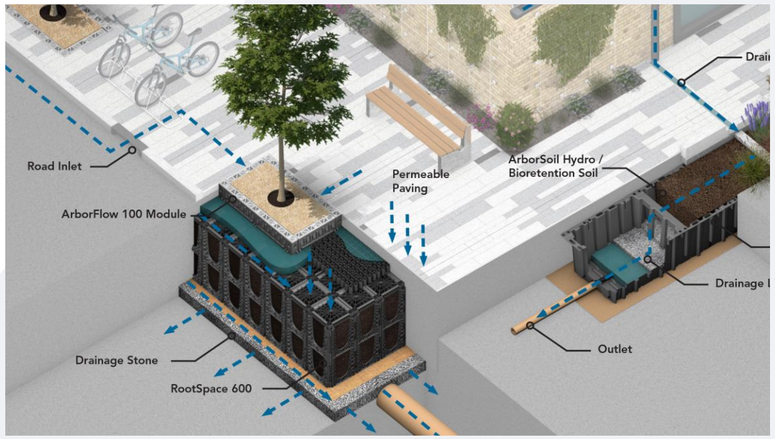
- A Green First Approach

South West Water



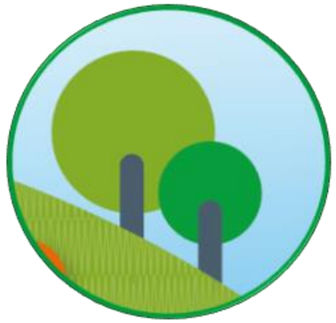
Enabling Quick Wins and Agile Support

- **Supporting tools and data** layers are being developed to highlight:
  - *“Quick-win” and “low-regret” opportunities*
  - *Rural runoff impacts (e.g. through CaSTCo)*
- **Field teams** provide on-site support to:
  - *Evidence and mechanisms*
  - *Validate solutions early*
- Engagement with **SuDS specialists**
  - *Co-creation of SUDS design guidance*
  - *Pilot projects to work through key / common design and construction challenges*



A New Delivery Model Takes Shape

- **Green First is a tactical delivery shift** - not just a design principle.
- Solutions preferred based on **Best-value**
- We're working fast now to embedding it so that we will:
  - *Meet and hopefully exceed our AMP8 targets*
  - *Set up AMP9 and AMP10 for success*
  - *Help normalise NbS in the delivery supply chain*
  - *Build industry-wide confidence through shared experience and success stories*



Green Solutions

- ✓ Slowing the flow
- ✓ Ecologically-driven processes
- ✓ Wider benefits for people & place

Blue Solutions

- ✓ Managing the flow
- ✓ Reducing or removing rainfall, inflow and infiltration
- ✓ Avoiding pumping & treatment

Grey Solutions

- ✓ Storing the flow
- ✓ Increasing speed through the system
- ✓ Increasing treatment capacity