


Working together to improve drainage and environmental water quality

An overview of Drainage and Wastewater Management Plans

September 2019



Commissioned by Water UK in collaboration with Defra, Welsh Government, Ofwat, Environment Agency, Natural Resources Wales, Consumer Council for Water, ADEPT and Blueprint for Water



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This document sets out how organisations with interests and/or responsibilities relating to drainage, flooding and protection of the environment can make improvements by working together to create Drainage and Wastewater Management Plans (DWMPs)

Introduction



How can DWMPs help you plan for the future?



What is DWMP? What benefits will it bring?



What area does a DWMP cover?



What are the key stages in creating a DWMP?



Why, how and when can you engage?



What's the programme for completing a DWMP?



What outcomes can be achieved by working together to create and implement a DWMP?



Working together case studies

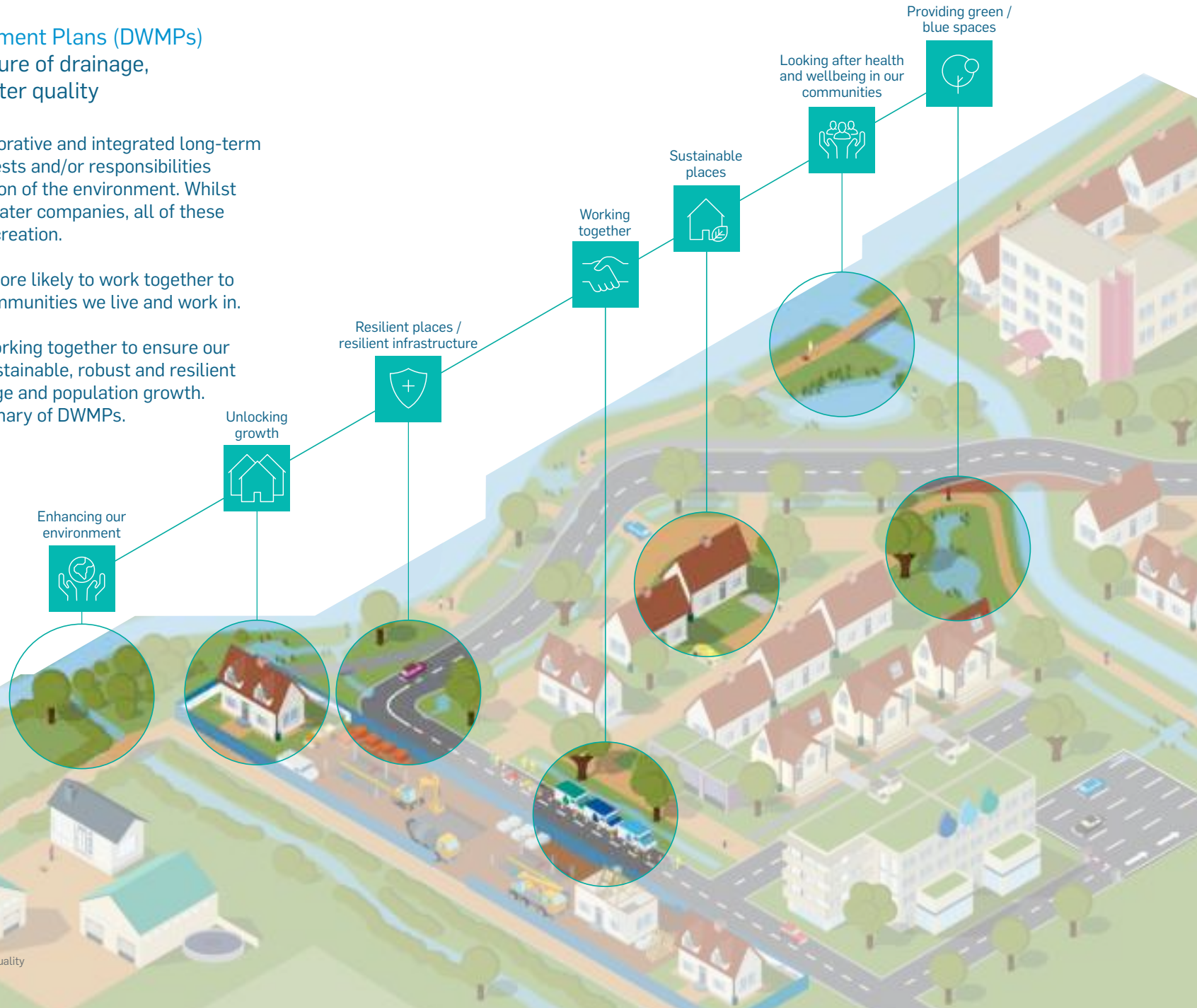


Drainage and Wastewater Management Plans (DWMPs) are the new way to plan for the future of drainage, wastewater and environmental water quality

DWMPs provide the basis for more collaborative and integrated long-term planning by organisations that have interests and/or responsibilities relating to drainage, flooding and protection of the environment. Whilst the production of DWMPs will be led by water companies, all of these organisations have a part to play in their creation.

By planning together, organisations are more likely to work together to deliver improvements that benefit the communities we live and work in.

This document outlines the benefits of working together to ensure our drainage and wastewater systems are sustainable, robust and resilient to future pressures such as climate change and population growth. It also provides an easily accessible summary of DWMPs.



How can DWMPs help you plan for the future?

Do you make and prioritise environmental improvements in your local area?

Are you updating your plans relating to flooding and environmental protection and enhancement?

How do you ensure each part of the drainage system has capacity to support development goals?

Do you work with other organisations to achieve green / blue space objectives?

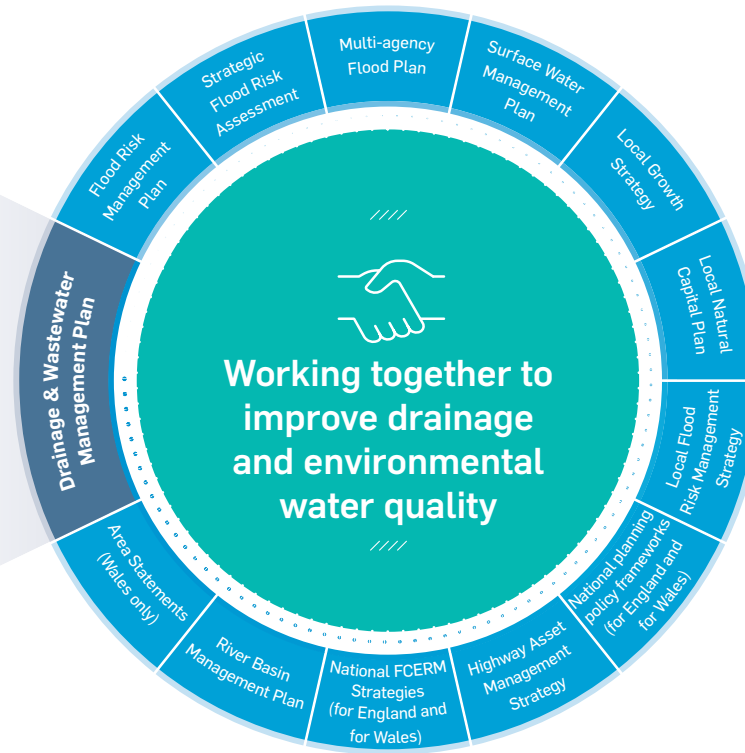
Are you working with other risk management authorities to address flood risk from multiple sources?

Are you undertaking place-based planning to improve the resilience of your communities?



DWMPs compliment and integrate with existing strategies and plans

Strategies and plans that manage drainage and environmental water quality risks



Outcomes that can be achieved by working together



What is a DWMP?

It's a long-term strategic plan that will set out how wastewater systems, and the drainage networks that impact them, are to be extended, improved and maintained to ensure they are robust and resilient to future pressures

It takes a long-term view, setting out a planning period appropriate to the risks faced, but with a minimum period of 25 years

It's a process that will identify priorities and costs to achieve future aspirations, and agree trade-offs where necessary

It's much more than just a water company plan

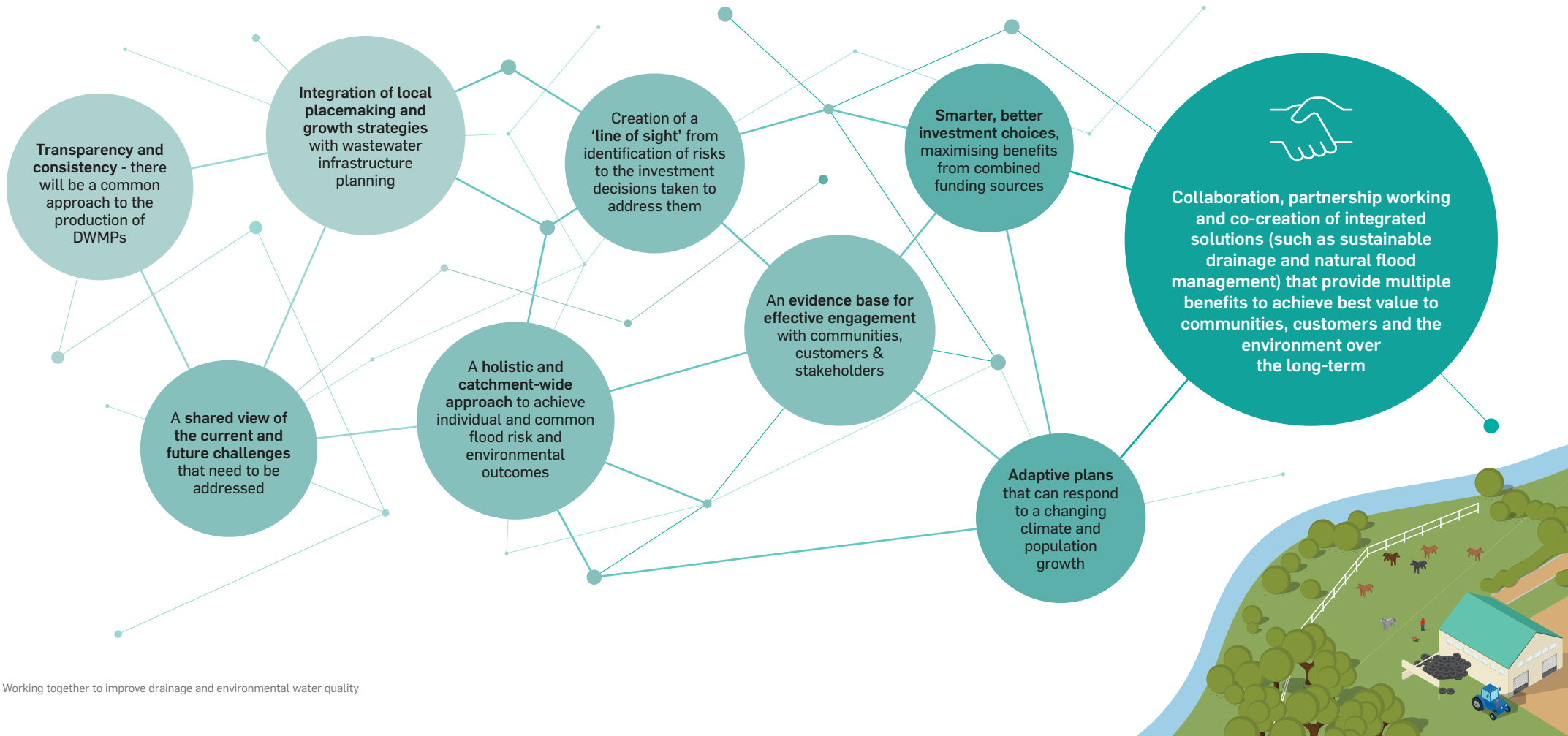
It's a way to understand current and future strategic risks to drainage and water quality in your area

It's an approach to ensure that plans recognise interdependencies between drainage systems

It's an opportunity to plan together, to generate efficiencies and maximise outcomes arising from co-creation and delivery of solutions that address the risks we face

It's a blueprint for our future

What benefits will it bring?



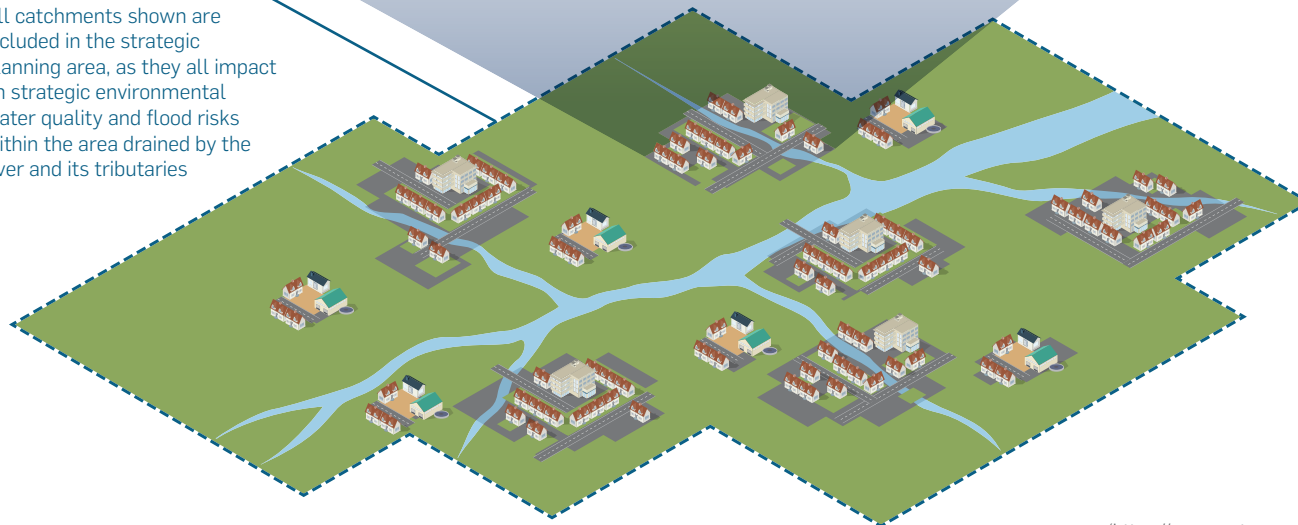
What area does a DWMP cover?

Local investigations will inform the creation of action plans for each strategic planning area



Strategic planning area

All catchments shown are included in the strategic planning area, as they all impact on strategic environmental water quality and flood risks within the area drained by the river and its tributaries



Action plans for each strategic planning area will be combined to create a DWMP (covering each of the wastewater areas served by water companies in England and Wales)

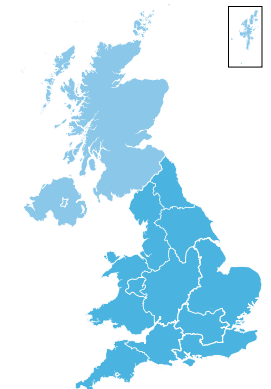
A DWMP will be created for **each of the wastewater areas served by water companies** in England and Wales¹. It will also consider the drainage networks that impact the wastewater systems. The DWMP will be compiled from action plans produced at a lower level, covering **strategic planning areas** that describe the local drivers for change and facilitate a more appropriate coverage area for collaboration / partnership working. Aligning strategic planning areas to the catchment areas that inform River Basin Management Plans and Flood Risk Management Plans will ensure environmental water quality impact and flood risk are appropriately considered in the process. In Wales, DWMPs are to influence and align with Area Statements (produced by Natural Resources Wales); these are a key mechanism to deliver environmental and social benefits across plans and sectors.

There are many organisations with formal roles and responsibilities relating to drainage, flooding and protection of the environment and many more with interests. By participating in the creation of a DWMP, much more can be achieved compared to working on plans in isolation.

Within each strategic planning area, the DWMP process will be overseen by **co-creation planning groups**², building on existing collaboration and partnership arrangements. Activities at the strategic planning area level will be informed by investigations covering the individual villages, towns and cities within each area³. **The structure supports working together at the most appropriate level to achieve objectives that are shared between participants.**



DWMPs will provide a picture of the actions we need to take, across England and Wales, to ensure our drainage & wastewater systems are sustainable, robust and resilient to future pressures such as population growth and climate change

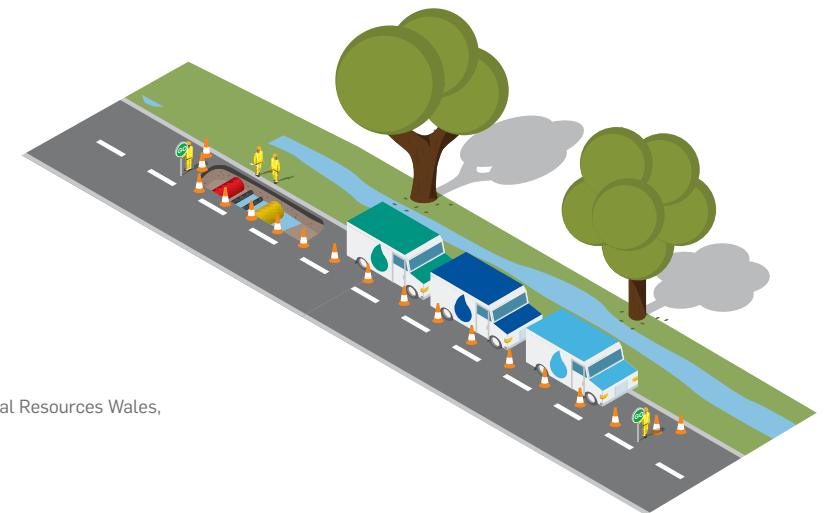
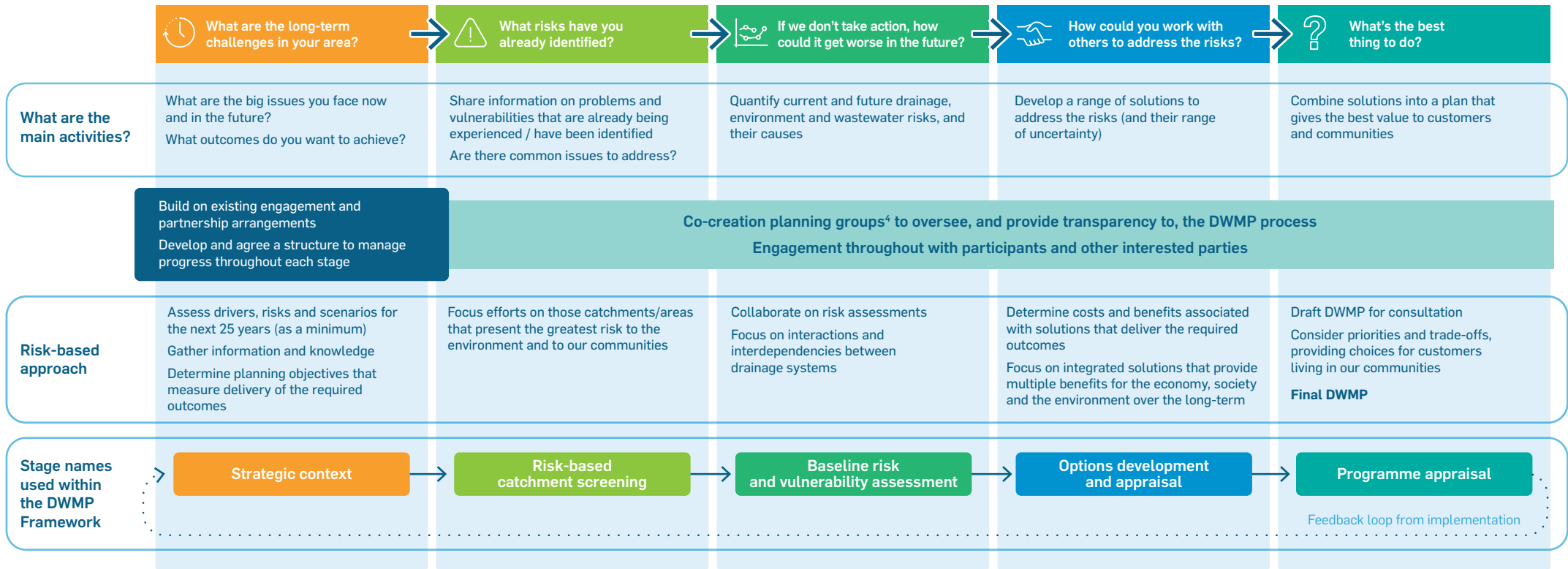


¹ The DWMP process is also expected to be of relevance to other parts of the UK

² Co-creation planning groups are called strategic planning groups in the DWMP Framework (<https://www.water.org.uk/policy-topics/managing-sewage-and-drainage/drainage-and-wastewater-management-plans/>)

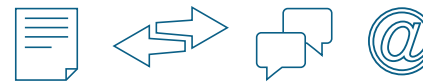
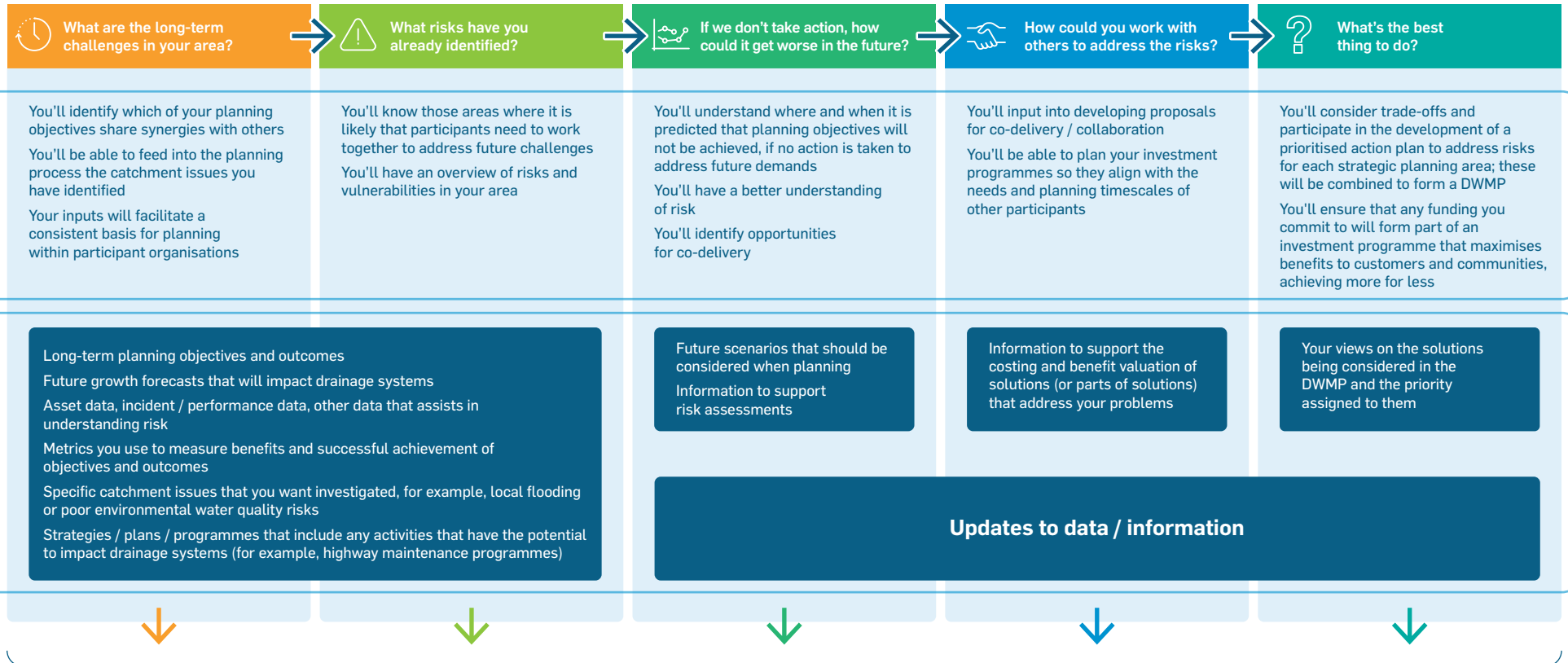
³ The DWMP Framework refers to the whole country as a Level 1 planning area, strategic planning areas as Level 2, and individual catchments/sub-catchments as Level 3 tactical planning units

What are the key stages in creating a DWMP?

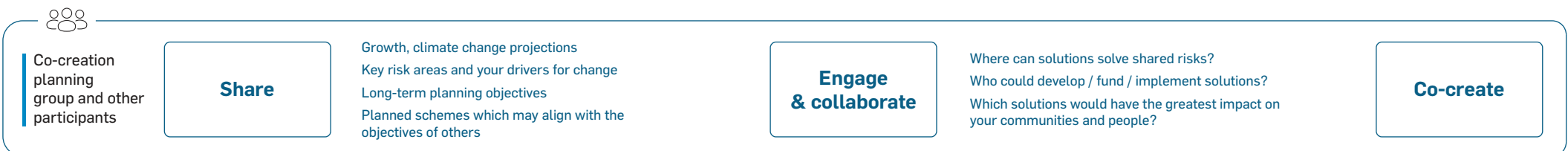


⁴ Co-creation planning groups comprising of key stakeholders including Local Planning Authorities, Lead Local Flood Authorities, the Environment Agency / Natural Resources Wales, the Highways Agency, third party providers, customer representatives and non-government organisations such as key environment groups (e.g. river trusts)

Why, how and when can you engage?



Share findings with customers / communities and act on feedback



What's the programme for completing a DWMP?

Flood & Coastal Erosion Risk Management Investment Programme
2015 – March 2021

River Basin Management Plans Cycle 2 2016 – 2021 / Cycle 3 2022 – 2027
Flood Risk Management Plans Cycle 1 2015 – 2021 / Cycle 2 2022 – 2027

Working together

➤ **DWMP:** Drainage & Wastewater Management Plan

• **FRMP:** Flood Risk Management Plan

• **RBMP:** River Basin Management Plan

DWMP activities may be undertaken earlier on specific priority catchments

In future iterations the planning cycles may differ to that shown for this first DWMP cycle

Besides DWMP activities, FRMP and RBMP activities are also shown, these being the key plans (with a similar spatial extent) that require a strategic, integrated approach to the management of flood and environmental water quality risks

2019

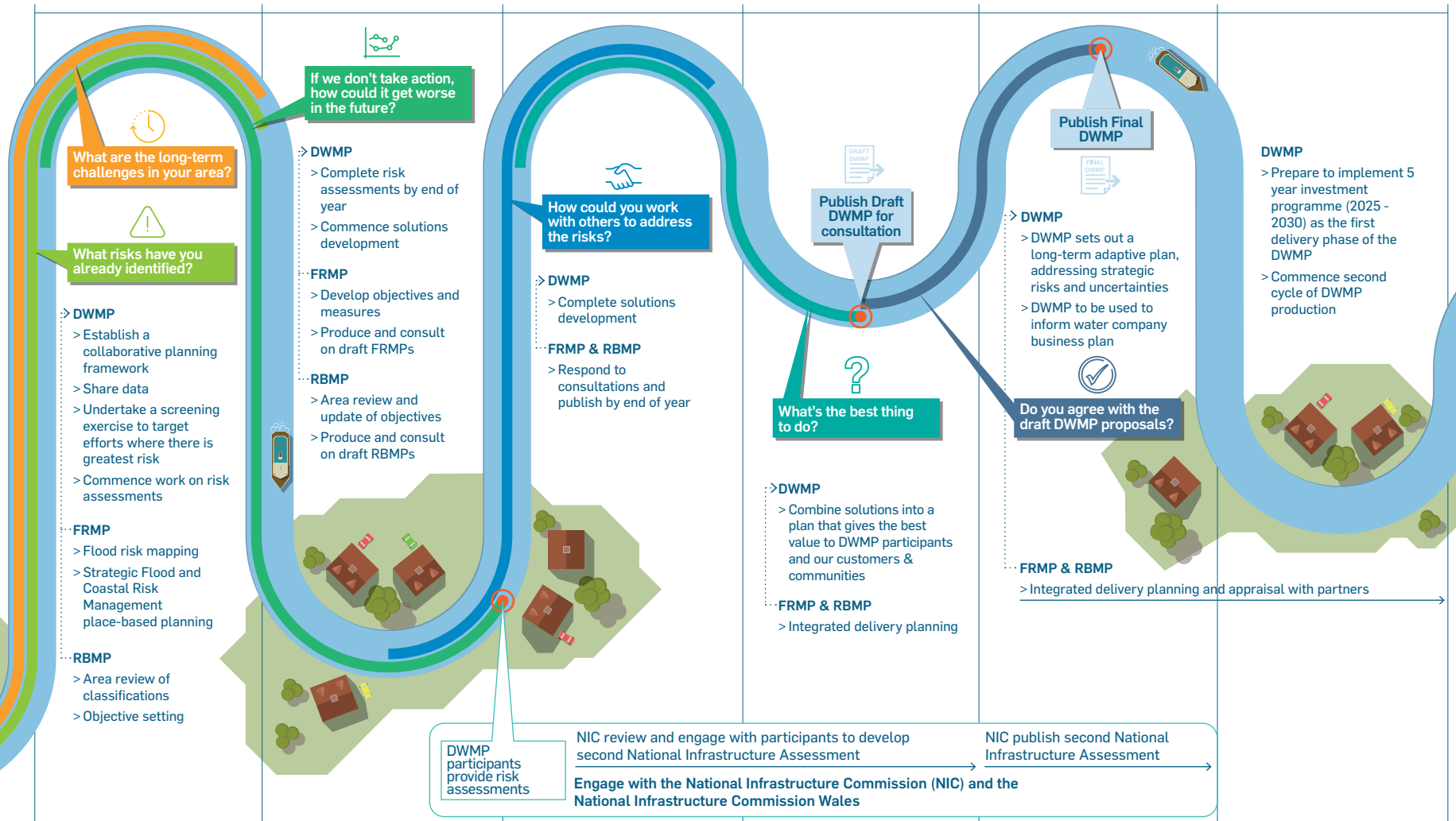
2020

2021

2022

2023

2024



What are the long-term challenges in your area?

What risks have you already identified?

If we don't take action, how could it get worse in the future?

How could you work with others to address the risks?

What's the best thing to do?

Do you agree with the draft DWMP proposals?

- **DWMP**
 - > Establish a collaborative planning framework
 - > Share data
 - > Undertake a screening exercise to target efforts where there is greatest risk
 - > Commence work on risk assessments
- **FRMP**
 - > Flood risk mapping
 - > Strategic Flood and Coastal Risk Management place-based planning
- **RBMP**
 - > Area review of classifications
 - > Objective setting

- **DWMP**
 - > Complete risk assessments by end of year
 - > Commence solutions development
- **FRMP**
 - > Develop objectives and measures
 - > Produce and consult on draft FRMPs
- **RBMP**
 - > Area review and update of objectives
 - > Produce and consult on draft RBMPs

- **DWMP**
 - > Complete solutions development
- **FRMP & RBMP**
 - > Respond to consultations and publish by end of year

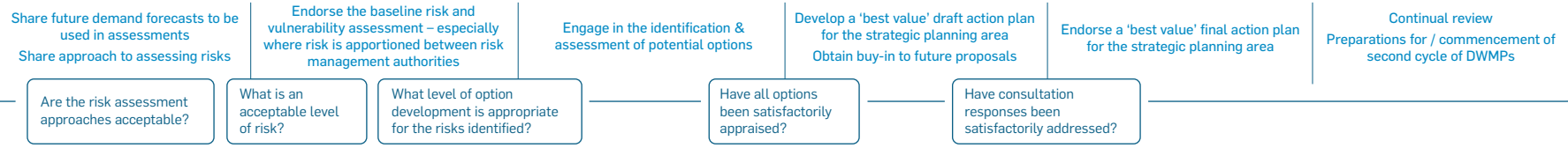
- **DWMP**
 - > Combine solutions into a plan that gives the best value to DWMP participants and our customers & communities
- **FRMP & RBMP**
 - > Integrated delivery planning

- **DWMP**
 - > DWMP sets out a long-term adaptive plan, addressing strategic risks and uncertainties
 - > DWMP to be used to inform water company business plan
- **FRMP & RBMP**
 - > Integrated delivery planning and appraisal with partners

- **DWMP**
 - > Prepare to implement 5 year investment programme (2025 - 2030) as the first delivery phase of the DWMP
 - > Commence second cycle of DWMP production

NIC review and engage with participants to develop second National Infrastructure Assessment
 Engage with the National Infrastructure Commission (NIC) and the National Infrastructure Commission Wales
 NIC publish second National Infrastructure Assessment

Co-creation planning group



Define ownership of solutions and, potentially, the means of resourcing and financing them (now and in the long-term)

What outcomes can be achieved by working together to create and implement a DWMP?

We have been working locally with our water company and local planners to understand drainage in the catchment and ensure that our partnership priorities are recognised:

- > In the Wissey catchment, we have identified and resolved misconnections with the Environment Agency and local collection managers.
- > In the Lark catchment, our partnership ambitions have been recognised as part of the West Suffolk planning strategy.
- > In the Cam catchment, we have united stakeholders to co-design a vision to double biodiversity and natural capital through effective drainage and growth planning.

Our future ambition is to unite this approach into a singular drainage and wastewater management plan for the Cam and Ely Ouse (CamEO) catchment, working with our water company to further develop actions across the catchment.

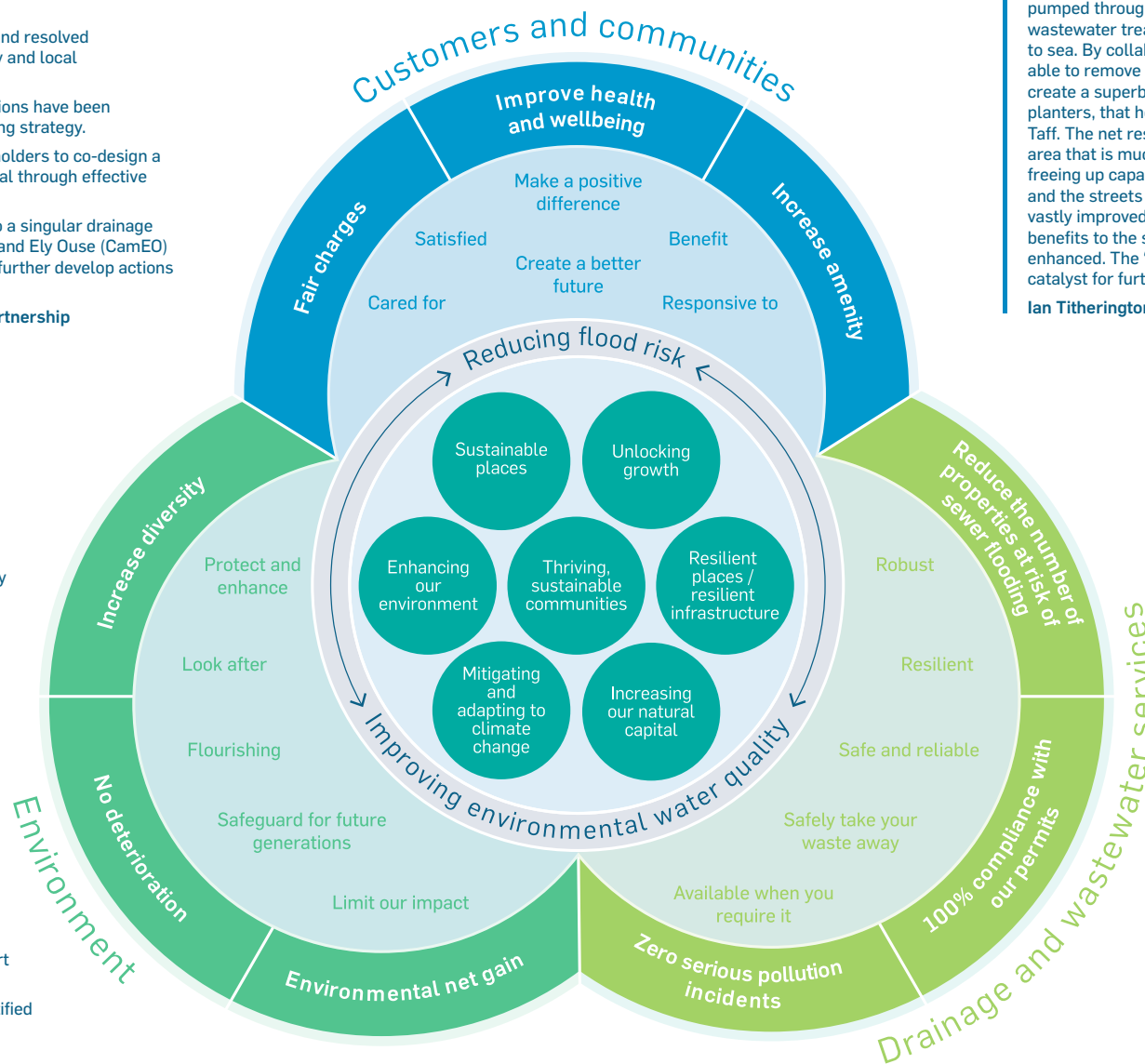
Martin Bowes, Co-Host, CamEO Catchment Partnership (representing the wider CamEO partners)

Plymouth City Centre is served predominantly by a combined sewerage system that is close or at full capacity. Intense rainfall, combined with the tide-locking of the limited surface water drainage system, can lead to flooding in the city centre and impacts on nearby bathing waters. The lack of surface water drainage can also result in reduced opportunities to implement SuDS solutions for new developments in an already congested area.

Working collaboratively with South West Water as part of an Integrated Urban Drainage Modelling programme of works, Plymouth City Council is developing through its Local Flood Risk Management Strategy, a network of new Surface Water Drainage Corridors within the city centre, to support the separation of existing surface water connections to the combined system and support new development going forward.

We expect that future opportunities will be identified and developed within the context of South West Water's DWMP process.

Andy Cottam, Principal Civil Engineer, Plymouth City Council



We identified a large area in Cardiff where all the roofs and roads drained direct to the combined sewer system. The flows were pumped through at least 2 lift stations before reaching the wastewater treatment works over 12 km away, then pumped out to sea. By collaborating with the local water company, we were able to remove most of the sub-catchment surface water and create a superb new streetscape with a series of street level planters, that help clean the water before it outfalls to the River Taff. The net result has created a wonderfully landscaped amenity area that is much appreciated by the local community, whilst also freeing up capacity in the sewer network. Air quality has improved and the streets are reclaimed from the commuter cars, with vastly improved pedestrian and cycling facilities. The multiple benefits to the social fabric of the area have been significantly enhanced. The "Greener Grangetown" project has acted as catalyst for further improvements across our city.

Ian Titherington, Lead Drainage Officer, Cardiff City Council

We want to make Greater Manchester grow in a sustainable way whilst making the city-region more resilient to increasingly extreme climate hazards. The Greater Manchester Spatial Framework, our plan for homes, jobs and the environment, sets out how and where we are planning to meet our growth requirement for the period to 2037. This is supported by an ambition to achieve carbon-neutral living by 2038, the development of an infrastructure framework, establishing innovative nature-based solutions, and associated funding and delivery mechanisms, to increase Greater Manchester's urban green infrastructure coverage.

With our vision in place and potential delivery mechanisms identified, Greater Manchester is well placed to engage with the DWMP process which we hope will inspire an integrated sustainable management model, that supports alignment of long-term planning for flood risk with water company business planning cycles and initiates innovative funding opportunities.

Jill Holden, Flood and Water Management Programme Manager, Greater Manchester Combined Authority

Case study: Northumbria Integrated Drainage Partnership

In support of an integrated partnership approach and following the success of the Northumbrian Tyneside Sustainable Pilot Project, the Northumbria Integrated Drainage Partnership (NIDP) was formed in 2014, consisting of Northumbrian Water, the Environment Agency and the fourteen Lead Local Flood Authorities covering the north east of England.



The integrated partnership approach has overcome the barriers associated with complex institutional and funding arrangements which divide drainage responsibilities between water and sewerage companies, the Environment Agency, Lead Local Flood Authorities (also local authorities planning and highways departments), housing developers and property owners.

Background

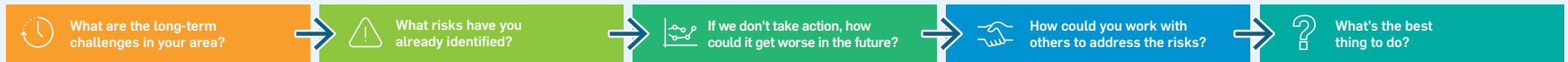
The purpose of the NIDP initiative is to establish a proactive cross organisation process and procedure to:

- > Create a template of how organisations can work together in communities to understand current and future drainage issues

- > Establish and implement data sharing and communication protocols (to include capacity building and knowledge sharing across organisations)
- > Identify and champion the delivery of integrated sustainable drainage opportunities including natural flood management techniques

- > Promote 'best possible' service to individuals and communities balanced against environmental needs and costs
- > Provide risk-based evidence to inform future business planning requirements for all parties

- > Identify and promote the organisational structures and relationships needed to deliver change in communities
- > Promote opportunities that deliver multiple benefits (social, economic and environmental)



Effective management of storm water runoff remains the biggest challenge now and in the future.

Many risks have been identified across the wide area covered by the partnership relating, in particular, to environmental water quality and flooding (affecting properties and other areas) from multiple sources.

Future pressures such as climate change, population growth and a reduction in permeable surfaces within urban areas will exacerbate current risks and introduce new ones, unless action is taken.

The following quotations provide examples of organisations working together:

The NIDP have developed a strategic level, area risk-based methodology to prioritise partnership working opportunities and provide a basis to apportion funding for collaborative planning. This identifies situations where responsibilities for drainage provision and the causes of flooding are shared or overlap. It does not replace any existing arrangements or responsibilities where flood risk from single sources may be present.

Climate change means that managing flood risk is an increasing challenge and we need to work as a team to maximise benefits from the limited funding available to risk management authorities. DWMPs are a great opportunity to better align future investment to better protect our communities. We already have seen brilliant examples of collaborative partnerships such as Killingworth and Longbenton Flood Alleviation Scheme and we hope to identify a number of others.

Jim Heslop, Environment Agency Pipeline Programme Manager

As a partner of the Northumbria Integrated Drainage Partnership and a Lead Local Flood Authority, we have been part of the stakeholder engagement throughout the DWMP implementation. We attended a pilot output stakeholder event which highlighted the DWMP process and steps, this was particularly useful to understand and to discuss how, as a Lead Local Flood Authority, our flooding and planning issues would be considered. It is an evolving process and we are keen to support and be part of the rest of the programme. We are currently engaged in reviewing the existing risks that have been identified, before assessments of future scenarios are undertaken, and are keen to feed our comments to the Northumbrian Water DWMP team.

Aaron McNeill, Flood Risk Manager, Northumberland County Council and NIDP Chair

The process provides:

- > An agreed annual delivery programme of prioritised and jointly funded integrated studies
- > A programme of prioritised and jointly funded studies for future years

The NIDP strategic prioritisation process has evolved and will continue to be enhanced and modified, for example to take into account new methodologies such as the "Five Capitals".



Killingworth Lake: modifications to the lake to accommodate additional storage

Picture credit – Killingworth Lake resident

The River Don Catchment Study is a perfect example of organisations working together to maximise benefits for all partners. The aim of the project was to assess the flood risk along the River Don whilst also considering water quality, biodiversity, ecology, morphology and climate change. The partners included Local Authorities, Environment Agency, Northumbrian Water, Durham Wildlife Trust and the Tyne Rivers Trust all of which had slightly different but complimentary objectives. The project involved a catchment-based approach to resolving issues and mitigating development pressure by combining and sharing knowledge, resources and skillsets and integrating and aligning multiple funding opportunities to maximising benefits.

Laura Turvey, Operations Manager, South Tyneside Council

Case study: Delivering constructed wetlands in Enfield

Enfield Council in its role as Lead Local Flood Authority has been identifying opportunities for and delivering constructed wetlands to manage flood risk throughout the catchment. By implementing these schemes to store surface water a principal aim is to reduce the risk of flooding from multiple sources. Between 2014 and 2019, eight schemes have been delivered, varying in size and scale.



A key success of the approach has been to realise as many additional benefits as possible and develop partnership approaches to each project, with support coming in the form of funding, expertise and delivery. A key component of each project is that it is designed to be appropriately incorporated into the existing character of the park or open space. At every opportunity the projects have looked to involve the community, for example, in the form of park friends groups.

Background

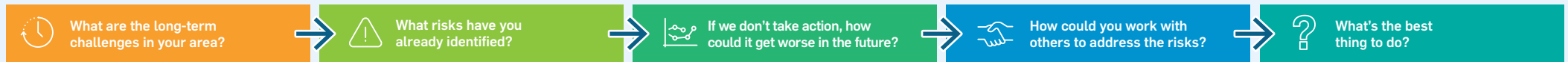
The geography of Enfield is that of well-defined main river catchments. These main rivers have been managed in different ways in order to enable development over the years. A wide range of flood defence systems are required to manage flooding and minimise any consequences of flooding to the local community.

These defences include all aspects of the drainage network, from simple road gullies to large channelised rivers, floodwalls and flood storage areas.

The Local Flood Risk Management Strategy identified an objective to divert surface water into constructed wetlands to act as flood storage areas, whilst delivering

additional benefits such as improvements to water quality in the catchments as a whole, enhancement of spaces for amenity, enabling opportunities for local community groups and schools to interpret and work with nature and increased biodiversity.

In order to deliver this programme successfully the Council has worked in partnership with various organisations on a project by project basis. A summary of the projects and partners is shown in the table.



The number of properties at risk of flooding in Enfield is high compared to most other local authorities. This is mainly due to the geography and layout of Enfield – most of the properties at risk of flooding are in the Lee valley area, which was historically an area of marshland. Consequently, a wide range of flood defence systems are required to manage flooding and ensure that Enfield's residents and businesses are not faced with unacceptable risk or disruption. Existing drainage systems and other flood defences are under constant pressure due to processes such as climate change and the reduction in permeable surfaces within urban areas (urban creep).

Using flood modelling across the borough and assessing the overall consequences of property damage or disruption to infrastructure, critical drainage areas have been identified. The flooding from a range of sources is assessed across these sub-catchments.

There is a difference in spatial extent between fluvial and surface water flood risk in general across Enfield. Flood models can be adjusted to test the impact of possible flood alleviation measures.

If no action were taken to manage flood risk, increased flooding would occur, and the consequences could be severe. The cost of this damage and disruption would outweigh the cost of continuing to manage flood risk. The cost effectiveness of flood risk management measures is tested by calculating the costs and benefits for the proposals. Only proposals that demonstrate a sufficiently high benefit to cost ratio are implemented. In order to maximise the benefits, the measures that are preferred are those which give multiple positive outcomes such as improvements in water quality in the catchment, improvements in amenity spaces for community participation and biodiversity increase.

To maximise the multiple benefits of sustainable drainage in existing communities it is essential to identify and implement opportunities to retrofit sustainable drainage systems. One example being constructed wetlands. Options have been identified and included on an action plan, a yearly programme of works on a project by project basis have been delivered by Enfield Council as the Lead Local Flood Authority, in each case seeking partners to help fund and deliver the work. Partners have ranged from charities, regional and national governance organisations, water and sewerage companies and corporate and social investments.

- > Develop a clear action plan of projects with the costs and benefits defined by carrying out feasibility studies
- > Work through consultation and design as sympathetic to the setting of the project as possible
- > Constructed wetlands have been delivered into parks and open spaces by considering the character of the existing space so that each scheme achieves acceptance in the community
- > Explore options for funding for each project and develop and build the scheme appropriately

Summary of wetlands projects and partners

Wetland Location	Year	Area (m ²)	Organisations	
			Lead	Support
Glenbrook	2014	600	Thames21	EA
Grovelands Park	2014	400	Enfield Council	T21, EA
Pymmes Park	2015	2,000		T21, TW
Firs Farm	2015	4,000		T21, TW, GLA, EA
Bury Lodge	2016	2,000		T21, EA
Prince of Wales Park	2017	2,000		WWT, TW
Enfield Town Park	2018	1,000		EA
Broomfield Park	2019	1,200		T21, RT, CCF, WWF

- EA Environment Agency (non-departmental public body responsible for Flood Defence Grant in Aid funding)
- T21 Thames21 (charity with strength in community involvement and water quality analysis)
- TW Thames Water (water and sewerage company with project funding opportunities)
- GLA Greater London Authority (devolved regional governance body responsible for funding allocations)
- WWT Wildfowl and Wetlands Trust (charity with expertise in conservation and community involvement)
- RT Rivers Trust (charity focussed on protecting and improving river environments)
- CCF Coca Cola Foundation (philanthropic arm of Coca-Cola with an environmental area of focus)
- WWF World Wide Fund for Nature (international non-governmental organisation with funding support)



Broomfield Park constructed wetland

Picture credit – Taking the Pixels

Case study: The Citizen Crane project

The Citizen Crane project was set up in early 2014 to investigate the water quality in the River Crane catchment in west London. Community volunteers joined together to form teams of 'citizen scientists', helping to understand the quality issues and to ultimately inform the solutions required to bring about long-term improvements.



The project is managed by a range of organisations including the Zoological Society of London, FROG Environmental and Friends Of the River Crane Environment (FORCE). The project is overseen by a technical steering group made up of the Crane Valley Partnership, the Environment Agency and Thames Water.

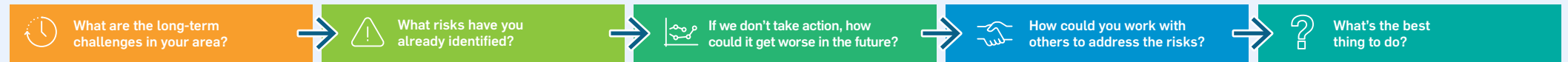
Background

The River Crane is a small urban tributary of the River Thames, running through five boroughs in west London, and covering a total area of 120 sq. km. The Crane Valley Partnership was formed in 2005 and includes 26 partners with objectives to protect and enhance the value of the River Crane and its tributaries.

A major pollution incident in 2011 decimated the ecological value of the middle and lower Crane. The Citizen Crane project was devised by Crane Valley Partnership members in response to this incident, with the intention of investigating the basic condition of the river, identifying and quantifying pollution risks and

sources, and working with key partners including the Environment Agency and Thames Water to reduce these risks and sources. Partnership working has already helped deliver water quality and wider ecological benefits to the River Crane.

The partnership is also helping to deliver wider flood risk mitigation. The citizen scientist approach has been a major success and shows how wider engagement with the public can help deliver benefits.



- > New developments driven by growth
- > Changes in flow conditions driven by climate change
- > Addressing historical issues relating to past pollution events and on-going chronic / acute pollution impacts

- > Working together the partnership organisations developed a staged approach to risk identification in the catchment; this was supported by data shared by Thames Water and the Environment Agency coupled to that obtained by the citizen scientist participants
- > Potential sources of chronic pollution have been identified (misconnections)

- > Without management of the issues water quality will continue to deteriorate impacting on the catchment's biodiversity and aquatic ecology
- > Shared expertise from the Environment Agency and Thames Water has helped to develop a conceptual quality model for the catchment to aid in risk assessment and progress monitoring
- > Continued engagement with all partners is considered essential to ensure that the benefits that are already being seen are sustained in the future

Partnership working (including with the Highways Agency, the Environment Agency and Thames Water) has led to the development of a range of operational and community engagement solutions (e.g. managing misconnections to surface water outfalls).

Innovation: The 'citizen scientist' approach adopted within the context of the Citizen Crane project to provide monitoring data and, for example, identification of problem outfalls (using innovative 'outfall safaris') has been core to the success to date of the project. The 'outfall safari' approach has been adopted more widely across a number of other London river catchments.

Outcomes: The linkup between the work of the citizen scientists in obtaining monitoring data and identifying suspect outfalls has already led to solutions which have delivered significant improvements, in a short period of time, in water quality in lower reaches of the River Crane.

Benefits of engagement with the local water company: On-going work and continued collaboration with Thames Water is envisaged – Thames Water has selected the River Crane catchment for further support from 2020 as an urban pilot of its 'Smarter Catchments' programme.

Long-term project viability: The long-term goal is to bring the River Crane to 'Good / High' status under the Water Framework Directive definition; achieving this will rely on the continued drive of the volunteers and partner organisations.



Citizen scientists

River Crane - downstream view from Cranford Park

As a local charity we rely on partnership working to help deliver on our objectives of protecting and enhancing the community and environmental value of the Crane valley. Working within the Crane Valley Partnership, and alongside long-term partners such as Thames Water, the Environment Agency and local authorities, has enabled significant improvements to be delivered along the Crane valley over the last ten years.

Rob Gray, Chair of FORCE



To participate in the DWMP for your area, please contact your local water company using the following email address:

Anglian Water	DWMP@anglianwater.co.uk
Dŵr Cymru Welsh Water	DWMP@dwrcymru.com
Hafren Dyfrdwy	DWMP@hdcymru.co.uk
Northern Ireland Water*	LivingWithWater@infrastructure-ni.gov.uk
Northumbrian Water	DWMP@nwl.co.uk
Scottish Water	DWMP@scottishwater.co.uk
Severn Trent Water	DWMP@severntrent.co.uk
South West Water	DWMP@southwestwater.co.uk
Southern Water	DWMP@southernwater.co.uk
Thames Water	DWMP@thameswater.co.uk
United Utilities	DWMP@uuplc.co.uk
Wessex Water	DWMP@wessexwater.co.uk
Yorkshire Water	DWMP@yorkshirewater.co.uk

*The Northern Ireland Department for Infrastructure is leading development of a version of the DWMP Framework that will be used across Northern Ireland from 2021. The 'Northern Ireland Integrated Drainage Investment Planning Guide' is scheduled to be launched in 2020.

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