Department for Environment Food & Rural Affairs

Cyfoeth Naturiol Cymru Natural Resources Wales

Llywodraeth Cymru Welsh Government

Environment Agency

Dee River Basin Management Plan 2021 – 2027 Summary

July 2022

Natural Resources Wales

Natural Resources Wales' (NRW) purpose is to pursue sustainable management of natural resources in all of its work. We've produced a booklet to introduce you to our new way of working. Welsh Government has issued statutory guidance on NRW's general purpose. The Environment (Wales) Act 2016 sets out our general purpose.

In the exercise of its functions NRW must:

- pursue sustainable management of natural resources in relation to Wales, and
- apply the principles of sustainable management of natural resources in the exercise of its functions, so far as consistent with their proper exercise.

We also have a duty under the Well-being of Future Generations (Wales) Act 2015 to maximise our contribution to the seven well-being goals, through sustainable management of natural resources. We do this by setting well-being Objectives, and ensuring our work contributes across our objectives.

Environment Agency

We are the Environment Agency. We protect and improve the environment.

We help people and wildlife adapt to climate change and reduce its impacts, including flooding, drought, sea level rise and coastal erosion.

We improve the quality of our water, land and air by tackling pollution. We work with businesses to help them comply with environmental regulations. A healthy and diverse environment enhances people's lives and contributes to economic growth.

We can’t do this alone. We work as part of the Defra group (Department for Environment, Food & Rural Affairs), with the rest of government, local councils, businesses, civil society groups and local communities to create a better place for people and wildlife.

Contents

Acronyms

Acronym	Meaning
ALS	Abstraction Licensing Strategies
AMP	Asset Management Plan
CaBA	Catchment-Based Approach
CSO	Combined Sewer Overflow
CJEU	Court of Justice for the European Union
DCWW	Dŵr Cymru Welsh Water
DrWPA	Drinking Water Protected Area
EA	Environment Agency
EU	European Union
FRM	Flood Risk Management
FRMPs	Flood Risk Management Plans
GBNNSS	GB Non-Native Species Secretariat
HMWB	Heavily Modified Water Body
HRA	Habitats Regulation Assessment
INNS	Invasive Non-Native Species
LLFA	Lead Local Flood Authority
NEP	National Environment Programme
NGO	Non-Governmental Organisation
NRP	Natural Resources Policy
NRW	Natural Resources Wales
NVZ	Nitrate Vulnerable Zone
PBDE	Polybrominated Diphenyl Ether
RBD	River Basin District
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SMNR	Sustainable Management of Natural Resources
SoNaRR	State of Natural Resources Report
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SuDs	Sustainable Drainage System
UKCIP	UK Chemicals Investigation Programme
UKFS	UK Forestry Standard
UKTAG	UK Technical Advisory Group
uPBT	ubiquitous, persistent, bioaccumulative and toxic
WFD	Water Framework Directive
WFF	Wales Fisheries Forum
WGWE	Welsh Government Woodland Estate
WLMF	Wales Land Management Forum,
WMAAG	Wales Marine Advisory and Action Group
WwTW	Wastewater Treatment Works
WWMF	Wales Water Management Forum

1. Planning for the future

1.1 Introduction

Under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (referred to as the WFD Regulations 2017) a management plan is required for each River Basin District (RBD). The Dee River Basin Management Plan (RBMP) was first published in 2009 and updated in 2015. This document is part of the latest update to that plan which has been undertaken jointly between Natural Resources Wales (NRW) and the Environment Agency (EA).

Responsibility for coordinating the planning of the future of waters in Wales lies with NRW and in England lies with the EA. However, NRW and the EA work jointly in the Dee RBD. Some waters in the RBD form the boundary between Wales and England, or cross from Wales into England or England into Wales. Joint working on the cross border waters is therefore essential to ensure the water environment is protected and improved. The aim is to achieve this through collaborative working with the land managers and local groups. Working together with partners increases the understanding of the priorities for action and helps to ensure that the appropriate measures are carried out. Where possible the same approach has been used to produce this plan. In some areas government direction or local policy has resulted in different methods to reach the same outcome. Where this is the case, it is clearly explained.

The plan sets the objectives for rivers, lakes, estuaries, coastal and ground waters. Although we are responsible for developing the plans, the outcomes and the actions needed to achieve them are for everybody. This plan outlines the actions we believe are needed to improve the environment, the benefits they could achieve and who is best placed to deliver them. River basin management is a continuous cycle of planning and delivery (see Figure 1).

Figure 1 River Basin Management planning cycles

The environmental objectives in this plan are legally binding and have been submitted to the Minister for Climate Change (in Wales) and Secretary of State for Environment, Food and Rural Affairs (in England) approval. The plan fulfils the requirements of the WFD Regulations 2017 and statutory guidance from government. It replaces the plan published in 2015, except for the economic analysis of water use in Wales. Further detail can be found in Section 3.6 of the **Planning Overview Annex (Wales)** and Section 2 of the **Planning Overview (Dee in England).**

The plan includes information on:

- Classification of water bodies – The baseline status in each water body. This enables us to understand the current condition of the water bodies including all the quality elements. Preventing deterioration from this baseline is a key objective of this plan, and also one of our greatest challenges in protecting the water environment.

- Summary of Programme of Measures to achieve statutory objectives – These include statutory objectives for Protected Areas. The programme sets out the actions over this planning cycle and forward planning. It includes local actions, in particular for Wales, Opportunity Catchments and in England the Catchment Based Approach which will be one of the key programmes to be taken forward over the next six years with a focus on collaborative working and the delivery of multiple benefits for people and wildlife.

- Statutory objectives for water bodies – Objectives have been set for each quality element in all water bodies, including an objective for the water body as a whole. The default objective is to aim to achieve good status or potential by 2027. However in some circumstances, we have extended the deadline or set an objective of less than good where this is justified on the basis of natural conditions, ecological recovery time, technical feasibility or disproportionate cost.

This plan has been influenced by the feedback from the consultations that were held over the last four years, further detail can be found in the **Planning Overview Annex (Wales**).

Many lessons have been learnt in the planning and delivery since the WFD was introduced in 2000 and transposed into law in England and Wales in 2003, by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003. The 2003 Regulations have been updated and replaced by the WFD Regulations 2017. The key lessons learnt include that early engagement with our partners is crucial; environmental improvements take time and may not be noticeable in the classification within a cycle; and making commitments on allocating resources on a six-year cycle is difficult. Since the first cycle our understanding of good status/potential requirements has evolved, and improved monitoring techniques and standards have been reflected in the classification. The Well-being of Future Generations (Wales) Act 2015 and Environment (Wales) Act (2016) give us an opportunity to build on the foundations WFD provided in developing a place-based approach and similarly in England through the Catchment Based Approach.

1.1.1 Finding your way around the River Basin Management Plan

RBMPs are strategic documents. Whilst the best intentions have been made to ensure this plan is accessible, the document is presented to meet the statutory requirements of the WFD Regulations 2017. A glossary of terms is included in the **Planning Overview Annex (Wales)**. If you are unable to find the information you require from this plan, please contact WFDWales@naturalresourceswales.gov.uk and we will help you.

The third RBMP is made up of several documents and an interactive web-based tool. These are described below. The supporting documents which contain the required statutory assessments of the RBMP are also outlined.

1.1.1.1 The River Basin Management Plan

Dee River Basin Management Plan 2021 – 2027, Summary (this document)

This summary describes the current condition of the RBD and what we have achieved since 2009, the Programme of Measures for improving the water environment by 2027, water body objectives and implementation for the third cycle.

Planning Overview Annex (Wales)

Provides the technical detail for Wales behind the decision making which has shaped the third RBMP. It refers and provides links to a number of supporting documents for the more technical information and guidance. Under the WFD Regulations 2017 there is also a requirement to publish an inventory of emissions, discharges and losses of priority substances for each RBD. This information, including the methodology can be found in the Planning Overview Annex (Wales).

River basin planning process overview: Dee River Basin District in England (Planning Overview (Dee in England))

Together with the **River basin planning guide to alternative objectives (Dee River Basin Management Plan)** provides information on the river basin management plan legislative framework in England. It details how the water environment is defined and described and the processes used for updating the objectives and the programmes of measures.

Dee River Basin District in England programmes of measures: mechanisms summary (Mechanisms Summary)

Provides the range of mechanisms available for implementing river basin planning measures in England, including cross-cutting legislation for protecting water.

Water Watch Wales – data, maps, Opportunity Catchments and Catchment-Based Approach (CaBA)

Much of the information referred to in this document is best presented in map or spreadsheet format. Information on the current state of the water environment, measures and objectives for improving it together with further information for the Opportunity Catchments and CaBA can be found on Water Watch Wales. This is an interactive spatial web-based tool that provides supporting information and data to assist partners. It enables the user to navigate to their area of interest and review the available information about that specific area. Data for Wales and England is included.

Protected Area Register

The register of the **Protected Areas** lying within the RBD has been reviewed and updated. It provides information on each protected area including: Drinking Water protected areas (surface water and groundwater), Shellfish Waters, Bathing (recreational) Waters, nutrient sensitive areas, water dependent European sites and in England, Nitrate Vulnerable Zones.

1.1.1.2 Supporting documents

Strategic Environmental Assessment (SEA) screening report

The SEA screening required to comply with the Environmental Assessment of Plans and Programmes Regulations 2004 was applied to the draft third cycle programme of measures. The SEA screening decision report for the Dee RBMP sets out the reasoning for not undertaking a full SEA. NRW determined that the third cycle could be considered as a minor modification of the RBMP, which was subject to full SEA in cycle one and two.

Habitats Regulations Assessment (HRA)

As required by the Conservation of Habitats and Species Regulations 2017 (Habitats Regulations 2017) a HRA of the Dee and Western Wales third RBMP has been carried out to consider whether the plans are likely to have a significant effect on any European site.

Some measures could not be screened out as having no likely significant effect because of the lack of available detail and were taken forward into the Appropriate Assessment. This approach was taken on a precautionary basis in light of changes in case law between the second and third cycles and the uncertainty of effects of certain measures at the high level of the RBMP. This conclusion should be considered in the context of the main aims of the RBMP, which are to improve the water environment including Protected Areas. The Appropriate Assessment sets out the criteria for deferring down the HRA of the Dee and Western Wales RBMPs to lower tier plans, programmes and projects. We are confident that the Dee and Western Wales RBMPs can be delivered without causing adverse effects on site integrity. The document is published alongside the plan.

1.1.2 Exit from the European Union

The United Kingdom (UK) left the European Union (EU) on 31st January 2020 and entered a period of transition until 31st December 2020. During the transition period the UK continued to apply EU legislation, transposed any EU legislative changes and remained under the jurisdiction of the Court of Justice of the European Union (CJEU).

The requirements of WFD were already enshrined within UK law through the WFD Regulations 2017. The Regulations form part of retained EU law in accordance with the European Union (Withdrawal) Act 2018. To ensure the WFD Regulations can function post EU-Exit, statutory instruments to correct Brexit-related deficiencies were introduced in Parliament and the Senedd, namely the Environment (Legislative Functions from Directives) (EU Exit) Regulations 2019 and the Floods and Water (Amendment etc.) (EU Exit) Regulations 2019. These amendments do not impact on the way we carry out the RBMP process.

1.1.3 Covid-19

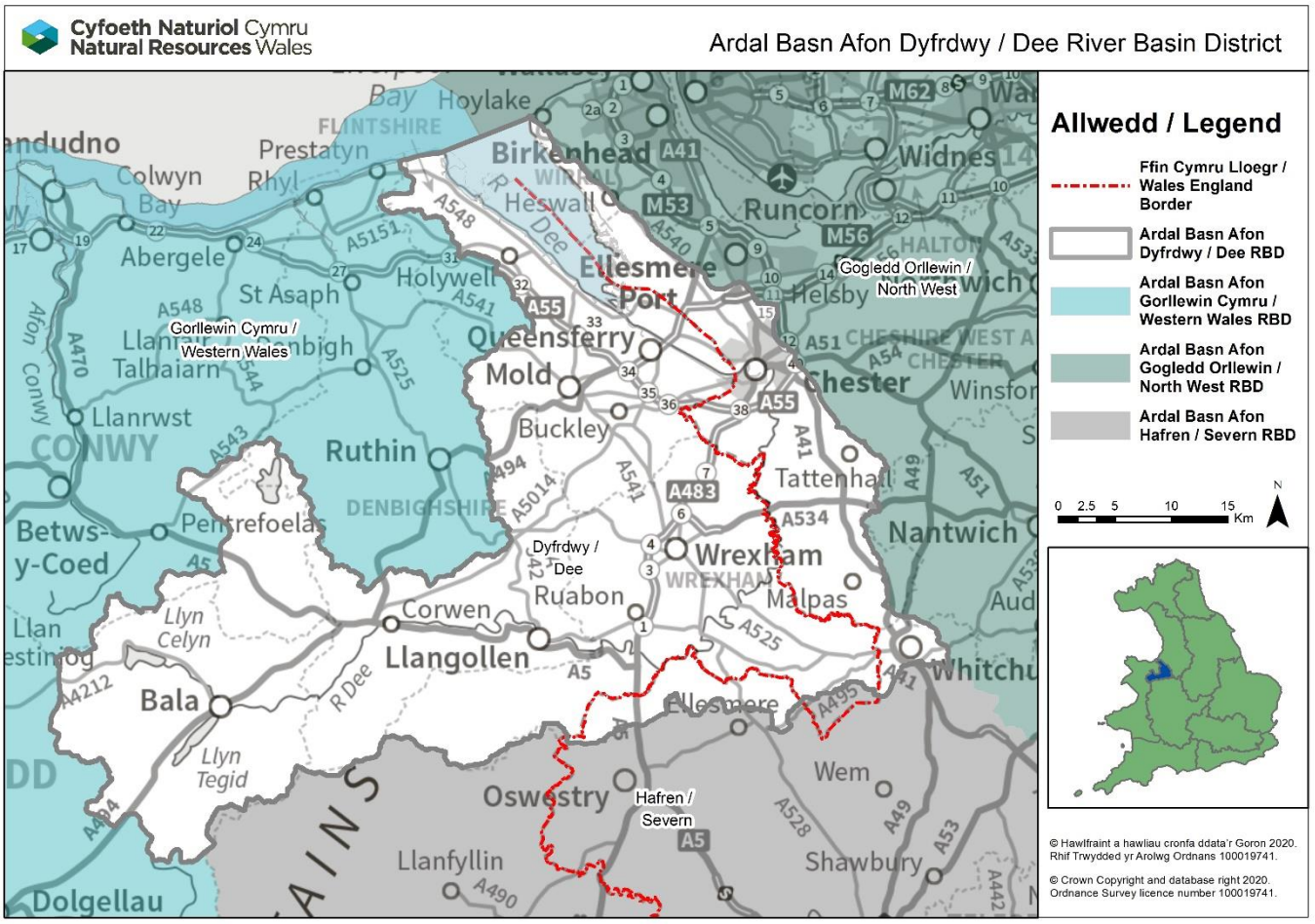
During 2020 and 2021 the Global Covid-19 pandemic and the public health response resulted in lockdowns and restrictions in order to limit the spread of the Covid-19 virus. The Welsh Government exercised its legal powers to make Regulations imposing restrictions or requirements on people with the purpose of preventing, protecting against, and controlling or providing a public health response to the incidence or spread of Covid-19 in Wales. Similar restrictions were also applied in England by the UK government.

This impacted on all organisations in Wales and England. For NRW and the EA, this meant we had to halt our monitoring programme, postpone or cancel some of our improvement projects and reduce the engagement with some of our stakeholders who had to furlough staff. It also impacted on the timing of the earlier consultation of this document. We do not yet know the scale of impact the virus and subsequent restrictions had on our work programme for the third cycle. Covid-19 has also opened broader opportunities in terms of society's connection to nature. People started exploring local outdoor spaces more during this period, which is a behavioural change that NRW should utilise and build on in the future.

1.2 Dee River Basin District

Figure 2 shows the boundary of the Dee RBD.

Figure 2 The Dee RBD



The Dee RBD is home to over 500,000 people and covers an area of 2,251 square kilometres of North East Wales, Cheshire, Shropshire and the Wirral. The RBD consists of a single river basin; the River Dee, its tributaries and estuary and is characterised by a varied landscape. It ranges from the mountains and lakes of the Snowdonia National Park in the upper part of the basin, through the Vale of Llangollen in the middle reaches, to the open plains of Cheshire and the mudflats of the Dee Estuary in the lower basin. The Dee and its tributaries are renowned for their excellent fishing and there is an important cockle fishery in the estuary. The River Dee is popular for canoeing and the National Whitewater Centre is located on the Afon Tryweryn near Bala.

The River Dee and Bala Lake/Llyn Tegid is designated as a Special Area of Conservation (SAC). The Dee Estuary is a Special Protection Area (SPA) and SAC. Chester and Wrexham are the two major urban centres, but the dominant land uses are agriculture and forestry, particularly in the upper part of the basin. Key economic sectors in the region include manufacturing, business services, retailing, health, banking and insurance. Bala Lake/Llyn Tegid, Celyn and Brenig reservoirs in the upper catchment are used for water storage to regulate river flows in the Dee downstream all year round. In the drier months,

typically between April and September, this is to sustain abstractions for public supply, and industry.

Nearly three million people get their drinking water from the Dee, including many in North West England. The reservoirs are used to modify flood response and reduce the flooding frequency in the Dee between Bala and Chester.

Since 1st April 2013 NRW and the EA are jointly responsible for managing the Dee Regulation System under the Dee and Clwyd River Authority Act 1973. NRW has agreed to lead on this under the terms of a service provision agreement with the EA. NRW and the EA are assisted in the drawing up of operational management rules by the statutory Dee Consultative Committee which comprises two members for NRW, one member for the EA, one member for the Canal and Rivers Trust, and one representative each from Hafren Dyfrdwy, Dŵr Cymru/Welsh Water (DCWW) and United Utilities.

Operational Management rules are established for operation of the scheme under normal and drought conditions. Within these rules and within the powers given by the Dee and Clwyd River Authority Act, NRW and the EA can specify the level of residual flow to be maintained over Chester Weir, and detail specific measures to be taken to reduce demands on the system in times of drought. Regard must also be given to mitigating flooding, supplying a specific volume of water to Canals & Rivers Trust for the Shropshire Union Canal, safeguarding fisheries and other purposes, including the specific features and habitats designated under the Habitats Regulations 2017 that may be affected by management of flows in the River Dee. The strategic importance of the Dee as a source of potable water and the risk posed to it from pollution have led to the Dee becoming one of the most protected rivers in Europe. In 1999, the lower part of the Dee was designated as the UK's first Water Protection Zone.

We aim to improve the environment through continued collective action. There are already many good examples of partnership working and we need to build on these. We need to ensure that the objectives for RBMPs are integrated in other plans and policies. In particular, this must involve our natural resource planning, Flood Risk Management Plans, Water Company Business Plans, Shoreline Management Plans and the Wales Rural Development Programme.

We recognise that a changing climate will have an impact on the benefits our environment provides. Working in partnership, we aim to develop our understanding of local impacts and build climate resilience and adaptation into river basin management.

1.2.1 What has been achieved so far

The Dee RBD has benefited from investment over the past thirty years and beyond which has delivered improvements that benefit people, wildlife and the economy. Since the updated RBMP was published in 2015, we have continued to improve our understanding of the pressures on the water environment allowing us to target actions to manage them. In 2015 28% of water bodies achieved good or better overall status. The most recent classification shows that this has improved to 38%. The comparison is made using the standards, assessment methods and water bodies that represent the best knowledge applied and therefore the most accurate view of the water environment at that time.

Many organisations (see Appendix 1) have worked together across the RBD on a range of projects, Catchment partnerships are in place for the Tidal and Middle Dee. These are groups of organisations with an interest in improving the environment in their local area. The partnerships work on a wide range of issues, including the water environment but also to address wider issues that are not directly related to river basin planning. In addition, the project board and steering group for the Dee LIFE project have been established, further information on this project is included in Appendix 1.

1.2.2 Who manages the Dee River Basin District?

There are many organisations which are responsible for managing the RBD. These organisations are often grouped by sector and are summarised in Table 1.

Table 1: Sector groups involved in river basin management

Sector	**Examples**
Agriculture and rural land management	Includes arable, livestock, forestry and horticulture.
Angling and Conservation	Includes angling and conservation groups
Central Government	Includes UK and Welsh Government and arms-length bodies (including NRW and the EA)
Domestic/General public	Includes individuals and community groups
Energy	Includes renewables and hydropower groups
Health	Includes Public Health Wales
Industry, Manufacturing and other Business	Includes chemicals, construction, food and drink, paper, textiles and metals
Local Government	Includes Local Authorities and National Park Authorities
Mining and Quarrying	Includes coal mining, non-coal mining and quarrying
Navigation	Includes inland water ways groups, port and harbour authorities
Non-Governmental Organisations (NGOs)	Includes environmental NGOs (including wildlife and river trusts) and other NGOs

Sector	Examples
Recreation	Includes ramblers, canoeists and amenity groups
Universities	Includes evidence gathering and interpretation
Urban and Transport	Includes air, road, railways and urban
Waste treatment, transfer, storage and disposal	Includes landfill, biowaste, waste treatment and transfer
Water Industry	Includes water supply, water and sewage treatment

Examples of plans and strategies related to water management by organisations represented by the above sectors are summarised in the **Planning Overview Annex (Wales)**.

We communicate and work with these sectors through our external stakeholder forums. In Wales, the Wales Water Management Forum (WWMF) provides an opportunity for the forum's membership organisations to share evidence and explore opportunities for working together to achieve the sustainable management of water in Wales - from source to sea. It is chaired by a NRW Board Member and meets twice per year. Meeting dates and records of minutes are published on our website. The forum also explores opportunities to develop, support and communicate shared messages and recommendations on the Sustainable Management of Natural Resources (SMNR). The WWMF works with the Wales Land Management Forum (WLMF), the Wales Fisheries Forum (WFF) and the Wales Marine Advisory and Action Group (WMAAG). The WLMF Agriculture Subgroup was tasked with undertaking an in-depth analysis to understand the root causes of agricultural pollution. The group looked at the ways in which these are currently addressed through investigation, agreement, reporting and delivery on potential solutions, taking an integrated approach and working across organisations. The group produced a report in April 2018 on tackling agricultural pollution.

In England, the National Waters Leaders Group which comprises national organisations from a range of sectors with a role leading the strategic management of England's waters. It is chaired by the EA and generally meets three times a year. The aim of the group is to work together across organisations/sectors to conserve, manage and improve the water environment as a valuable resource for business, people and wildlife. The group promotes better water management for future generations by taking a whole water system approach to managing pressures such as climate change and population growth.

The Water Leaders Group objectives are to:

- influence national policies and processes, though an integrated approach, to conserve, manage and improve the water environment
- steer environmental water planning to meet the objectives in RBMPs

- lead and drive action to conserve, manage and improve the water environment, promoting partnerships and empowering others to play their part
- share knowledge, good practice and lessons learnt in water management

1.2.3 Scale within the Dee River Basin District

This plan refers to three management units: RBDs, management catchments and water bodies. The RBD is the largest and is the entire area to which this plan relates. RBDs are divided into smaller management catchments which enable more localised decision making and water bodies are the individual or parts of rivers, lakes, estuaries, coastal waters or groundwaters which we monitor and report on the quality. For the Dee, the RBD and management catchment is the same.

Managing the water environment is not always best co-ordinated at the RBD scale. In Wales, under the Environment (Wales) Act 2016, boundaries covered by Area Statements have been published (see Figure 5 on page 18) and will be a new way of working, relying on collaboration with partners and stakeholders. Nevertheless, catchments are still important and will be managed as part of working across Area Statement boundaries.

The EA also works with the individual organisations from the National Water Leaders Group and those involved in catchment partnerships on a daily basis, both nationally and locally, either directly or through joint involvement in other groups and projects.

NRW is able to make some significant improvements through our own activities, for example:

- Managing the Welsh Government Woodland Estate
- Operating flood management and hydrometry assets
- Managing National Nature Reserves

NRW and EA are regulators, ensuring that legislation to protect the environment is applied fairly in accordance with our regulatory principles. We also work with local and national partners to deliver projects and initiatives to improve the water environment. In Wales, examples of this include the Welsh Government Water Strategy for Wales, developing NRWs approach to SMNR, the Metal Mines Strategy for Wales and the Marine Protected Area Management Action Plan. In England, examples of this include delivering the UK Government's 25-year plan outcomes, Water Company Business plans and catchment plans developed by catchment partnerships under the Catchment Based Approach. Other strategies are at a UK level and include the UK Marine Strategy and the UK strategic approach to tackle risks from harmful chemicals in UK waters.

1.3 Taking a Place-Based Approach in Wales

The Environment (Wales) Act 2016 states that NRW must prepare a report containing its assessment of the state of natural resources in relation to Wales. The second State of Natural Resources Report (SoNaRR) for Wales 2020 report builds on the evidence base in the first State of Natural Resources report 2016 illustrating some of the key pressures, impacts and opportunities for action. SoNaRR2020 draws on a number of Welsh, UK and

global assessments of the status and trends of natural resources and looks at the risks those trends pose to our ecosystems and the well-being of Wales as defined in the Well-being of Future Generations (Wales) Act 2015.

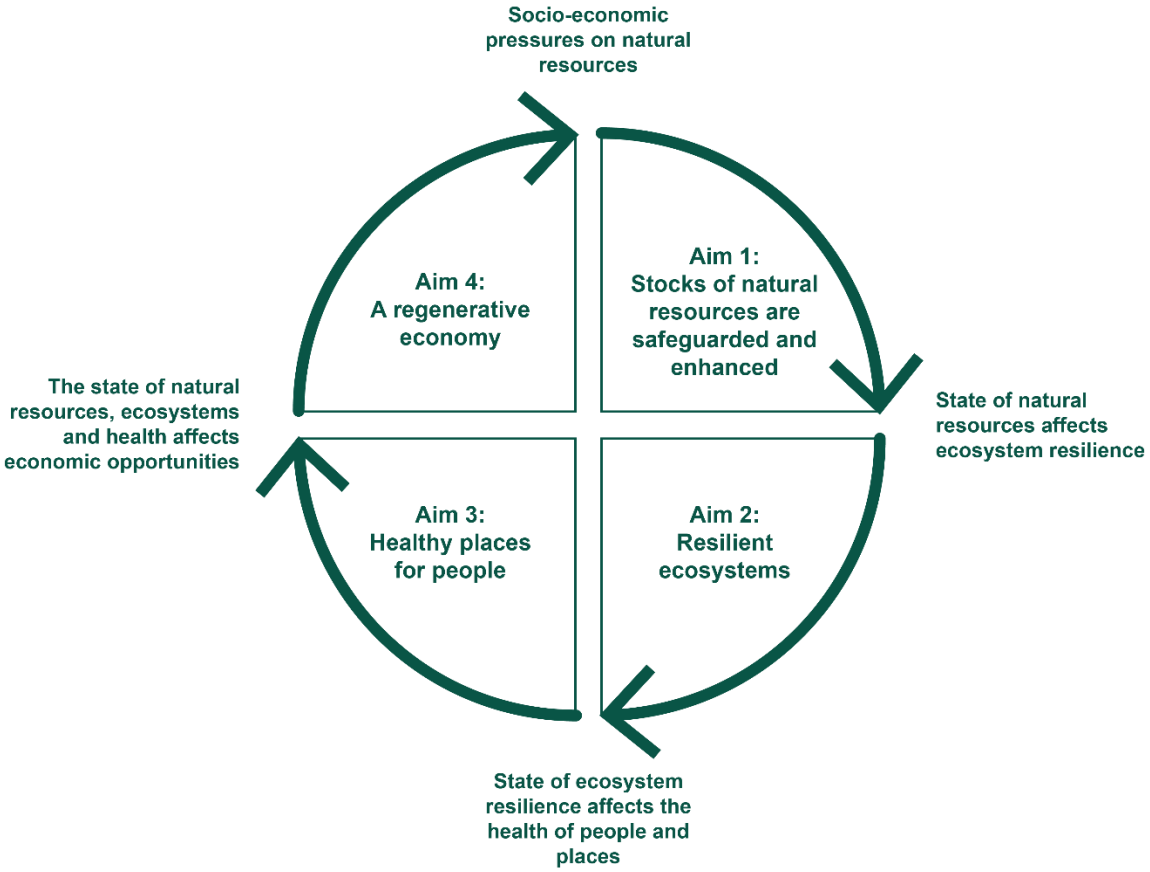
The eight broad ecosystems and a number of cross-cutting themes are used in SoNaRR2020 to assess SMNR. These are the building blocks of NRWs overall assessment. The key issues within the Freshwater chapter are climate change, physical modification, pollution, decline in freshwater biodiversity, lack of connectivity between rivers and their flood-plains and invasive non-native species (INNS). The chapter presents evidence of the state of freshwater ecosystems and the pressures affecting their health and the opportunities for achieving SMNR for freshwater ecosystems. The key pressures and opportunities for marine and transitional ecosystems are identified within the Coastal margins and the Marine chapters of SoNaRR2020.

Since the publication of the first SoNaRR the four long-term aims of SMNR have been agreed which guide the assessments that underpin SoNaRR2020. The four aims of SMNR are:

- Stocks of Natural Resources are safeguarded and enhanced
- Ecosystems are resilient to expected and unforeseen change
- Wales has healthy places for people, protected from environmental risks
- Contributing to a regenerative economy, achieving sustainable levels of production and consumption

Wales' progress towards SMNR within SoNaRR2020 is assessed individually against the four aims although they are also inseparable from each other. The diagram in Figure 3 shows the linkages and cyclical nature of the fours aims of SMNR:

Figure 3 Linkages and cyclical nature of the four aims of SMNR, SoNaRR2020



The SoNaRR 2016 report formed an important evidence base for Welsh Ministers to consider in the preparation of the Natural Resources Policy (NRP), for NRW when preparing Area Statements and for local planning authorities when refreshing local development plans. Under the Environment (Wales) Act 2016, there is a requirement for Welsh Government to publish the NRP which sets out the national priorities, challenges, and opportunities in Wales. The NRP was prepared taking into consideration the findings of the SoNaRR 2016 report.

The Environment (Wales) Act 2016 outlines the policy framework to enable the environment to be managed in a more proactive, sustainable, and joined up way. It includes a duty for NRW to produce Area Statements to help implement the priorities set out in the Welsh Government's NRP. There are seven areas or 'places' in Wales, including the marine environment. Each area has a live Area Statement document summarising the challenges and opportunities relevant to that area, which was first published in April 2020. The delivery of Area Statements requires a new way of working and relies upon successful collaboration with partners and stakeholders.

The Well-being of Future Generations (Wales) Act 2015 made it a requirement for all public bodies to work towards the seven Well-being Goals and think about how their decisions will affect people living in Wales now and in the future. The Act puts in place a Sustainable Development Principle which tells organisations how to meet their duty under the Act. There are 5 things the public bodies need to think about to demonstrate they have applied this principle: Long term, Prevention, Integration, Collaboration, and Involvement. The Act establishes Public Service Boards (PSBs) for each local authority area in Wales.

PSBs are responsible for publishing an Assessment of Local Well-being and a Local Well-being Plan.

Water ecosystems provide important ecosystem services including water supply, renewable energy production, flood management, recreation and fisheries. Balancing the use of these services with one another and the sustainable management of catchments is a significant challenge. For the third cycle of the RBMP, we aim to take a place-based SMNR approach to catchment prioritisation which delivers water quality and physical habitats outcomes/improvements plus wider benefits to the environment and people. This would include delivery of flood risk management benefits, benefits for freshwater, coastal and marine ecosystems and species aligned with well-being benefits for people.

Partnership projects aim to work with tenants, landowners and residents to improve land and water management to benefit the people and wildlife of the area. Catchments as a whole are an important factor and will help opportunities for working across Area Statement boundaries. By taking a more holistic approach to catchment management, better outcomes can be achieved for the environment and the well-being of people.

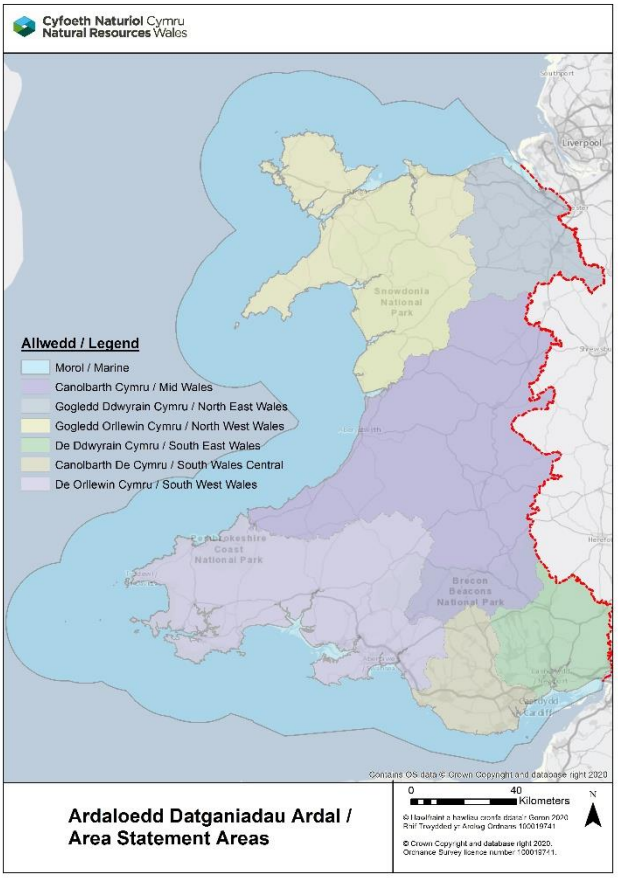
The Environment (Wales) Act 2016 introduced nine principles to help provide a method and a guide for considering SMNR, which are shown in Figure 4 below. The principles of SMNR are how we embed the four aims of SMNR. Involvement of partners and stakeholders in the Area Statements process is an important step to support implementation of the priorities, challenges and opportunities outlined within each.

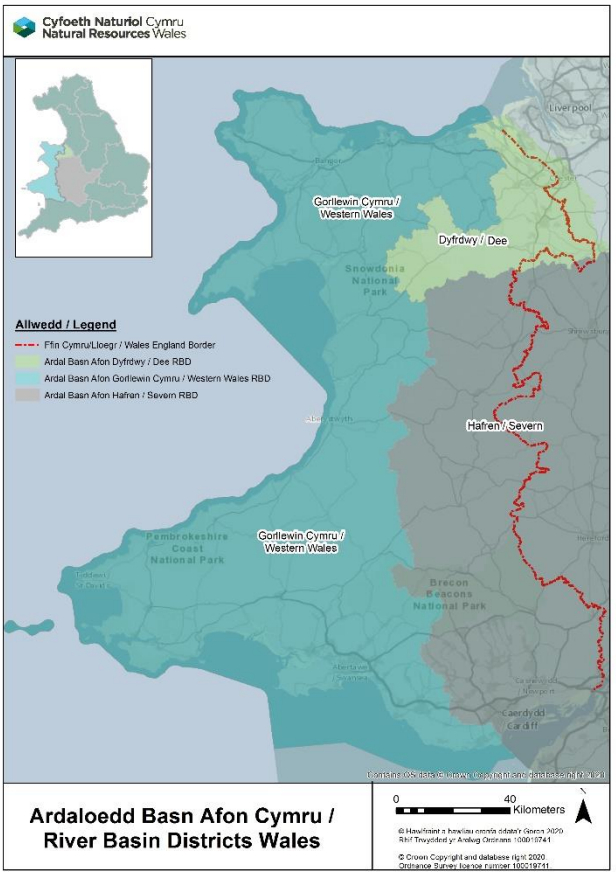
Figure 4 Nine principles of SMNR

Area Statements include information about the natural resources in that place, the benefits provided, and the priorities, risks and opportunities that need to be addressed by all to achieve sustainable management within that area. Area Statements will also be used to shape NRW's business planning and partnership working including projects linked to outcomes for our water bodies. They are used to influence a range of public plans and policies to help integrate sustainable water management across other delivery mechanisms including land use planning, land management, flood risk and water company planning.

Area Statements are therefore both an evidence base and a prioritisation tool to help us all understand the opportunities to deliver sustainable management at an appropriate scale right across Wales. Figure 5 below shows a map of the Area Statement areas and the RBDs in Wales for comparison. The Dee RBD includes the North East Area statement and part of the North West Area Statement as well as the Wales Marine Area Statement as shown in Figure 5.

Figure 5 Maps of Area Statement Areas and RBDs in Wales





1.4 Taking a Place-Based Approach in England

In 2013, the Department for Environment, Food and Rural Affairs (Defra) launched the Catchment-Based Approach (CaBA). The catchment-based approach promotes collaborative working at a river catchment scale for environmental, social and economic benefits.

The Tidal Dee and Middle Dee are two partnerships in the Dee RBD. The Middle Dee partnership is hosted by the Welsh Dee Trust and the Tidal Dee by The Cheshire Wildlife Trust Limited. Both catchments include water bodies across England and Wales, so a cross border approach was adopted from the outset to enable joint working, optimise funding opportunities and maximise environmental benefits. Both partnerships are supported by a steering group consisting of a variety of stakeholders. Catchment Partnership Pages summarising the partnership vision, challenges and actions in each partnership are available on Water Watch Wales, for the Tidal Dee and Middle catchments.

The aims of the partnerships are to maintain, enhance and protect the Dee catchment and estuary by promoting collaborative working between organisations to improve the water environment.

Defra launched the 25 Year Environment Plan in January 2018, setting out how to deliver an improved environment within a generation. This included exploring, through a number of 'pioneer' projects, more integrated local delivery between catchment partnerships and other local planning initiatives such as local authority planning. The learning from these projects is being reviewed and assimilated into new ways of integrating local delivery through approaches such as natural capital accounting.

The Environment Act 2021 passed into law in November 2021 and is now part of the new legal framework for environmental protection. It includes a number of new initiatives such as Biodiversity Net Gain, Nature Recovery Network, Local Nature Recovery Strategies, and links to Local Authority spatial planning. These coupled with the catchment-based approach and a new Environmental Land Management Scheme for agriculture, will strengthen local placed based delivery in England.

1.5 Evidence Needs

NRW and EA are evidence informed organisations with evidence activities defined as:

- Strategic research/investigations
- Surveillance, monitoring, and data capture
- Analysis
- Tactical research/investigations

Evidence needs in Wales have been developed by NRW, and are set out in a water evidence needs paper which seeks to address emerging issues such as chemicals and identifies opportunities for collaborative research projects relating to the water environment in Wales. Additionally, in SoNaRR2020 each of the eight broad ecosystem chapters have

their own associated evidence needs list which are included within the overall evidence needs table, the marine and coastal evidence needs are also listed within the Welsh Marine Evidence Strategy.

How evidence is used for waters in England is contained in the **Planning Overview (Dee in England)**.

2. The Dee River Basin District

2.1 How we determine baseline classification

Classification is an assessment of the quality of our surface waters and groundwaters undertaken at a point in time. It includes monitoring data required by the classification tools which vary from 3 to 6 years prior to the publication. It is based on operational routine monitoring points within a water body and is risk based. This classification and information on the pressures and risks to waters is the basis for planning each cycle.

Throughout each cycle of the RBMPs, we collate all the evidence, historic and current, and produce a baseline classification. Classification is the process by which the data collected in our water monitoring programmes is turned into the evidence we need to advise, regulate and manage the water environment. We have a statutory duty to assess and report on the status of every classified water body, but the benefits of classification are far wider. It is used to inform many other areas including water industry investment plans, set permit limits, inform environmental impact assessments of proposed projects and activities and management. In Wales, it is also a key evidence source for SoNaRR and a national indicator for the Well-being and Future Generations (Wales) Act 2015.

We use the term water bodies to help understand and manage the water environment. A water body is part, or the whole, of a river, lake, groundwater, transitional (estuary) or coastal water. Water bodies are reporting units and are indicators of the health of the wider water environment. We assess the condition of these water bodies through monitoring or modelling which produces a classification. The legal requirements set out in the WFD Regulations 2017 apply to all bodies of water in a RBD, not just the water bodies that are shown on the maps. During the first RBMP cycle (2009-2015) the classification was updated annually. However, in Wales it is now updated once every 3 years for surface waters. The most up to date classification for Wales is the 2021 classification and this is available on Water Watch Wales. In England, it is the 2019 classification. This combined dataset forms the most recent classification which is used to report in this plan.

The number and type of water bodies are shown in Table 2 below setting the baseline for the third cycle. Note that the Llangollen canal crosses the border between Wales and England and is reported by the EA as part of the Severn RBD.

Table 2: Number and types of water bodies in the baseline third cycle Dee RBD (2021-27).

Number of water bodies	**Natural**	**Heavily Modified**	**Total**
River	50	21	**71**
Lake	4	13	**17**
Coastal	0	0	**0**
Estuarine	0	1	**1**

Number of water bodies	Natural	Heavily Modified	Total
Groundwater	5	0	**5**
Total	**59**	**35**	**94**

2.1.1 Changes for the third cycle

The data and information used in the management of the water environment is regularly reviewed and improved. We use a set of data, standards and tools that help us complete the classification.

For the third cycle of RBMPs some water bodies have been amended. Further detail on the changes listed below can be found in Appendix B of the **Planning Overview Annex (Wales)**. The main changes are:

- Correction of errors, for example where a water body is named incorrectly or associated with the wrong operational catchment
- Revisions made to some of the second cycle Artificial/Heavily Modified Water Bodies (A/HMWB) designations and/or uses and new Heavily Modified Water Body (HMWB) designations
- De-designated water bodies that were no longer being used for the designated use as Drinking Water Protected Areas

For the third cycle RBMPs the classification has also been reviewed based on improved science, better understanding of the environment, policy and **directions from UK or devolved Governments**. The changes between the second and third cycle RBMPs are not considered to be major and include:

- Monitoring networks
- Environmental standards, for example Nitrogen standards for lakes, river acidity standards
- Changes to classification tools based on advice from UK Technical Advice Group (UKTAG) and other technical experts – for example Estuarine Fish Classification Tool
- Invasive non-native species
- Number of chemicals assessed
- Classification of ubiquitous, persistent, bioaccumulative and toxic chemicals (uPBT)

Further details of these changes are in the **Planning Overview Annex (Wales).**

2.1.2 Surface waters - status

For rivers, lakes, coastal and estuarine water bodies, the classification is based on the ecological and chemical condition of the water body. We collect biological and chemical data, which are combined to give an **overall status** of high, good, moderate, poor or bad, based on the lowest reported class from the different elements monitored.

Ecological status is determined from a combination of data for biological, physico-chemical and specific pollutants.

Chemical status is assessed by compliance with environmental quality standards for chemicals.

Many of our waters have been changed by human activity for a specific use such as navigation, flood management or water storage. In some cases, this change may mean that it is impossible to achieve good ecological status whilst allowing the human use to continue. For example, maintenance dredging for port activities will not allow good status to be achieved for benthic invertebrates in a harbour water body. In these cases, the water body is designated as artificial or heavily modified and has an objective to achieve good ecological potential. This is a measure of the best ecology the water body could achieve given the constraints required by the human use. There are 89 surface water bodies in the Dee RBD, including rivers, lakes and one estuary.

Table 3 and Table 4 below shows the number of water bodies in each status class in the most recent ecological and chemical classification data.

Table 3 Most recent ecological classification for surface waters (assessed water bodies)

No. of water bodies	**Bad**	**Poor**	**Moderate**	**Good**	**High**
River	2	6	32	31	0
Lake	1	1	11	4	0
Estuarine	0	0	0	1	0
Total	3	**7**	**43**	**36**	0

It should be noted that since 2015 an error in the biological monitoring data was detected for the Morlas water body which was reported as good instead of moderate. Using the corrected data shows that there is no change in the biological status of the Morlas water body.

Table 4 Most recent chemical classification for surface waters (assessed water bodies)

No. of water bodies	**Fail**	**Good**
River	14	57

No. of water bodies	Fail	Good
Lake	0	17
Estuarine	1	0
Total	**15**	**74**

2.1.3 Groundwaters - status

For groundwater, the quantitative and chemical status are combined to provide a single final classification, good or poor status. A groundwater is at poor quantitative status if there could be adverse impacts on rivers and wetlands or it is not certain that the amount of groundwater taken will be replaced each year by rainfall. Poor chemical status occurs if there is widespread diffuse pollution within the groundwater body, the quality of the groundwater is having an adverse impact on wetlands or surface waters, there is saline intrusion due to over abstraction, or the quality of water used for potable supply is deteriorating significantly.

Of the 5 groundwater bodies in the Dee RBD all achieve good quantitative status and 3 achieve good chemical status. The 2021 classification has identified 1 groundwater body where a significant rising trend in chemical status has been identified since 2015, requiring further investigation.

Table 5 and

Table 6 below show the most recent classification of quantitative and chemical classification for groundwater.

Table 5: Most recent classification of quantitative classification for groundwater

No. of water bodies	Poor	Good
5	0	5

Table 6: Most recent classification of chemical classification for groundwater

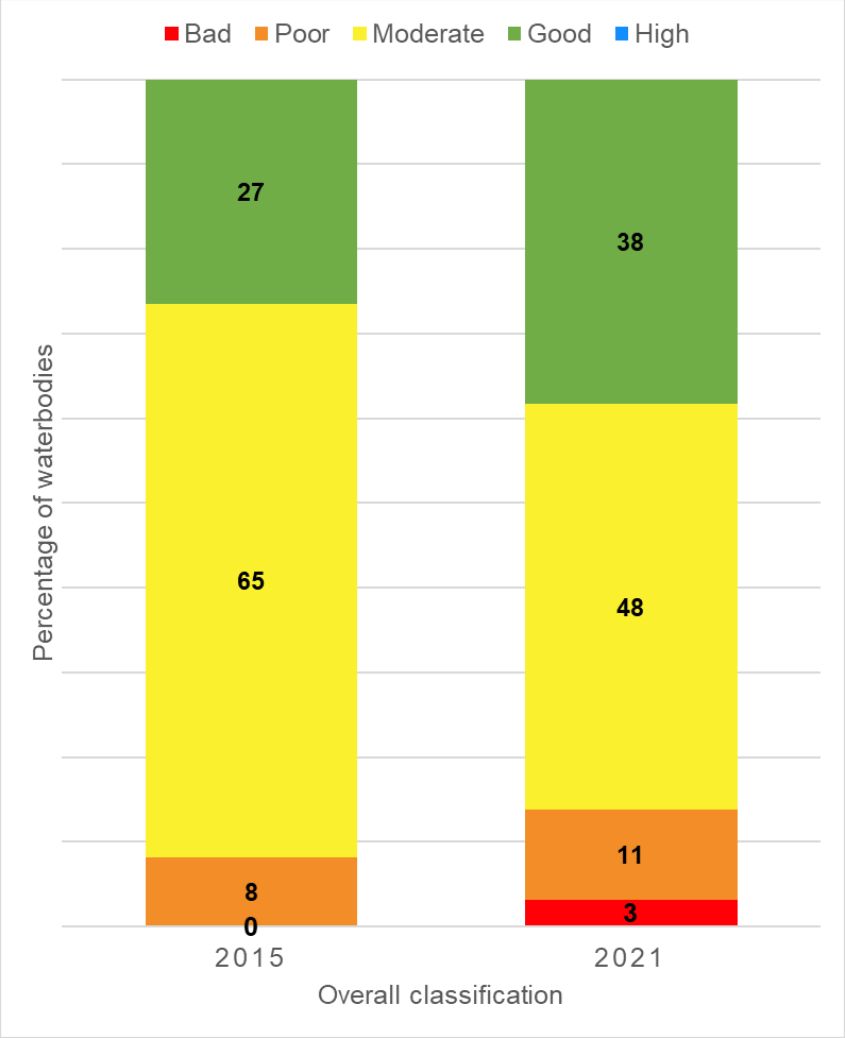
No. of water bodies	Poor	Good
5	2	3

2.1.4 Changes to classification since 2015

2.1.4.1 Overall status

In 2015, 27% of water bodies in the Dee RBD achieved good or better overall status (Figure 6). We predicted that this would rise to 35% by 2021. The most recent classification results indicate that 38% of water bodies achieved good or better overall status. The comparison is made using the standards, assessment methods and water bodies that represent the best knowledge applied and therefore the most accurate view of the water environment at that time.

Figure 6 Comparison of the overall baseline classification in 2015 with the most recent classification for the Dee RBD

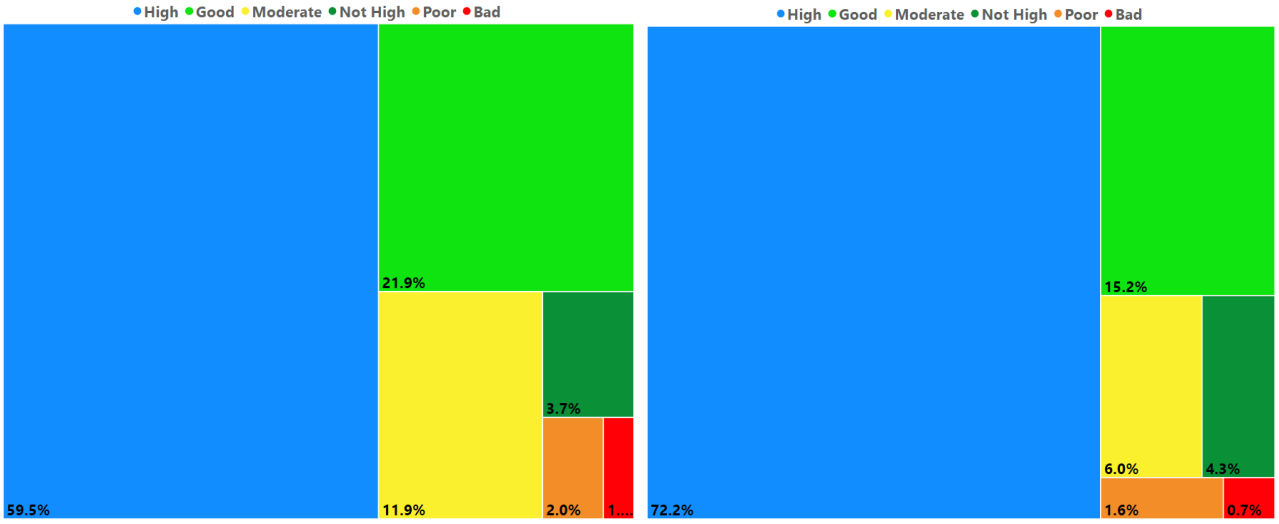


It is important to understand the number of water bodies implicated in the change in overall status. The Dee RBD is the smallest in Europe and contains only 94 water bodies. Thus, only a small number have to change to be reflected as a significant change in percentages. The differences in the overall status since 2015 can be attributed to completion of mitigation measures assessment work through the Restoring Sustainable Abstraction work and having data to classify rather than using expert judgement for some water bodies. The Dee estuary has remained at moderate ecological potential between 2009 and 2021.

2.1.4.2 Element level status

For each water body the overall water body classification is made up from a number of different chemical, biological and physical elements (e.g. Mercury, benthic invertebrates, dissolved oxygen). Classification requires that the overall status should be the lowest of all the individual elements. The one out all out rule does not reflect the improvements and significant compliance at the element level. To provide further detail it is useful to view compliance at an element level basis that gives a better holistic view of environmental status. Figure 7 represent a summary of the element level data for each of the five classes using the most up to date information compared to 2015. The area of each category in the charts below is proportional to the result of each class. In the Dee RBD, 92% of elements assessed individually are at good or better status in 2021 compared to 85% in 2015 demonstrating an improvement at an element level over this period.

Figure 7 Dee element level 2015 (left) and 2021 (right)



Looking at the data for the different types of water bodies in the Dee RBD, in 2021, 93% of elements are at good or better status in rivers, 75% for lakes, 96% for transitional waters and 85% for groundwater. The overall view of status at an element level is positive and demonstrates the effort that NRW, EA and partners have contributed to protect and improve the status of the water environment.

By assessing the status of the different elements for each water category we can also identify elements that have proportionally more water bodies at less that good which may require greater focus on over the third cycle. In rivers, the elements that have the most failures are phosphate and mitigation measures assessment. Nutrients and mitigation measures in heavily modified water bodies are key elements to improve and focus on over the third cycle in order to achieve good overall potential which are discussed more in Chapter 3.

2.1.4.3 Deterioration

In Wales, a comparison between the start and end of second cycle classifications using the same standards and water body network shows that 14 elements in 9 surface water bodies and 2 groundwater bodies require further investigation to understand the causes of a deterioration in status. These causes may be due to monitoring changes, data queries or real environment change as a result of pressures on the water environment. We will

investigate these as soon as practically possible and where a deterioration has been confirmed as a result of real environmental impact then we will put a programme of measures in place to return the water body to its previous status.

In England, a comparison between the start and end of second cycle classifications showed a potential deterioration in one surface water body and one groundwater body. The deterioration in the groundwater body is for the Drinking Water Protected Area (DrWPA) element. This has been investigated by Hafren Dyfrdwy and action to reverse deteriorations will be developed in Asset Management Plan 8 (AMP8). A review of the data available for the surface water body shows the deterioration is uncertain. If an actual deterioration is confirmed the cause will be identified and measures to restore the water body to its previous status will be put in place.

2.2 Chemicals including those that are ubiquitous, persistent, bioaccumulative and toxic (uPBTs)

Chemicals can impact on the aquatic ecosystem in the following ways:

- Aquatic life (fish, plants and invertebrates) from direct exposure to chemicals in UK waters
- Human health and higher wildlife predators from chemicals that may accumulate via the aquatic food chain
- Surface water and groundwater sources where chemical contamination may compromise their on-going use to supply water for domestic or food production purposes

In Wales and England chemicals are managed in the water environment within the framework of a strategic approach to tackle risks from harmful chemicals in our waters. Chemicals in the environment are derived from a variety of sources. Some chemicals are ubiquitous and are best managed at a national scale whereas others are particular to an activity and their management should be focused at a local scale. Many chemicals are banned from production and/or use but are persistent in the environment for long periods of time and continue to be monitored to demonstrate that existing controls are adequate, and concentrations are decreasing. Managing chemicals will ensure that we minimise the impact on aquatic life and human uses of water.

As new chemicals are manufactured and used, and our assessment of chemicals has improved to better manage any risks, the range of chemicals and the way they are assessed has evolved since the first RBMP. The WFD Regulations 2017 identifies a subgroup of chemicals which are uPBTs that require special consideration for monitoring and presentation of classification results. These uPBTs are reported in full for the first time in this RBMP. The risk assessments are explained in section 4.4.3 of the **Planning Overview Annex (Wales)** and are based on best available evidence and show a significant risk of failing the standards for Polybrominated Diphenol Ethers (PBDEs) and Mercury. The chemical fact sheets are in Appendix C of the **Planning Overview Annex (Wales)** which show that these chemicals have been phased out of use and further measures would not be practicable. However, because of the persistence of these

chemicals in the environment it is likely that there will not be widespread compliance with standards in the next planning periods.

Because of the bioaccumulative nature of uPBTs we are now directed to monitor these chemicals in the tissue of fish and shellfish. We cannot sample the environment for these chemicals as widely as we do with water samples and we will only sample fish and shellfish when we are confident that we are not impacting on natural populations. This limits the number of water bodies we assess for these kinds of chemicals in Wales and so NRW is actively investigating other methods and techniques to assess the risk to higher trophic levels that uPBTs pose. In England the approach to chemical classification best represents the national picture on uPBT substances. Since the last RBMPs were published in 2015, the EA has significantly expanded their biota monitoring programme, but it is not practicable or ethical to monitor the presence of these substances in aquatic animals in as many locations as for water samples and it is still small compared to the water monitoring network. For this reason, biota monitoring sites represent much larger geographical areas than water monitoring once a robust baseline has been achieved.

It is possible that differences between classification outputs may be seen in cross border catchments for uPBTs and in particular PBDEs and Mercury because of differences in the evidence that is available to England and Wales. The UK regulators continue to work closely together on the subject of chemicals classification. We have each developed an approach that makes best use of the evidence available to us. Whilst the approaches to classification may differ, the measures applied to reduce uPBTs in the water environment are broadly comparable across the administrations and driven from national and international legislation and monitoring the reduction of these chemicals in the environment will continue to ensure that measures are appropriate.

Emerging chemicals, including some pharmaceuticals, are of increasing concern in the water environment. NRW have a robust monitoring programme for emerging chemicals which is used to identify emerging risks and therefore those that may require additional regulation and measures. Following EU Exit, the UK regulators are working together to identify emerging chemicals and to regulate those that pose a significant risk. In some cases that may result in national source control, in other cases this may mean working closer with health boards, pharmacists and Public Health Wales to reduce the amount of pharmaceuticals used in society and therefore entering the water environment.

2.2.1 Emissions Inventory

Under the WFD Regulations 2017 there is a requirement to publish an inventory of emissions, discharges and losses of priority substances for each RBD. This information including the methodology can be found in the **Planning Overview Annex (Wales)**. The inventory was compiled using environmental monitoring and point source effluent discharge data. In the longer term the inventory is intended to track the effectiveness of control measures on priority substance discharges at a national level.

2.3 Protected Areas

There are a number of areas in the Dee RBD where the water environment is particularly important. Protected Areas defined by WFD Regulations 2017 and listed in our Protected Area Register have legal protection under a range of UK Regulations (see **Planning Overview Annex (Wales)** and **Planning Overview (Dee in England))**. Protected Areas

can have different objectives for compliance. Where the standards required for doing this are more stringent than those required to achieve good ecological status, we must endeavour to achieve those more stringent standards.

The number and type of Protected Areas are shown in Table 7 to Table 12 below. Note that where a Protected Area crosses the boundary of more than one RBD, we report in the RBMP which holds the majority of the area in order to avoid duplication. See **Planning Overview Annex (Wales) and Planning Overview (Dee in England)** for further details and links to sources of compliance data for different types of Protected Areas.

In Wales the Nitrate Pollution Prevention (Wales) Regulations (2013) have been revoked and replaced by the Water Resources (Control of Agricultural Pollution)(Wales) Regulations 2021. Measures to protect the environment from pollution by nitrates from agricultural sources will now apply to the majority of holdings in Wales after the transition periods (these apply to holdings not previously in a Nitrate Vulnerable Zone). Nitrate Vulnerable Zones in Wales previously included on the Protected Area Register have been removed.

Some areas of estuarine and coastal waters are designated as Shellfish Waters. Shellfish Waters are areas requiring protection or improvement to support shellfish life and growth in order to contribute to the high quality of shellfish for people to eat. In addition to generic objectives for surface waters (good status, no deterioration and so forth) there is a requirement for environmental objectives to be set for Shellfish Waters such as are necessary or desirable to improve or protect the Shellfish Water. The additional objective for Shellfish Waters is a microbial standard of 300 or fewer *E.coli* per 100ml of shellfish flesh that the EA and NRW must endeavour to observe. We consider a Shellfish Water to be meeting this objective if it has been compliant in 8 of the last 10 years. Neither the Dee East nor Dee West have met this objective.

Table 7 Drinking water protected areas (DrWPA)

Water body type	Total Number	Number in Wales	Number at risk	Number in England	Number at risk
Surface water	**15**	15	7	0	N/A
Groundwater	**5**	5	0	1	1

The Dee Permo-Triassic Sandstone Groundwater body is a large cross border Groundwater Body and is included for both England and Wales with a different at risk status. Note: Part of the Wirral and West Cheshire Permo-Triassic Sandstone Aquifers Groundwater body is located within the Dee RBD but is reported in the Environment Agencies North West River Basin District Plan and is not duplicated in these figures.

Table 8 Shellfish Water protected areas

Water body type	Total Number	Number in Wales	Number in England	Meeting objective
Shellfish Waters	2	1	1	0

Table 9 Bathing Water protected areas

Water body type	Total Number	Number in Wales	% Compliant	Number in England	% Compliant
Bathing Water	1	0	N/A	1	100

Table 10 Nutrient Sensitive area protected areas

Water body type	Total Number	Number in Wales	Number in England	Length (km)/Area (km^2) designated
Eutrophication in rivers	1	1	0	27km

Table 11 Nitrate Vulnerable Zones (England only)

Water body type	Number in England
Nitrate Vulnerable Zone	8

Table 12 European site protected areas

European site protected area	Total Number	Number in Wales	Number in England
Water dependent SACs	9	6	3
Water dependent SPAs	4	2	2
Ramsar sites	3	2	1

For the purposes of the RBMP water dependent Special Area of Conservation (SAC's), Special Protection Areas (SPAs) and Ramsar sites have been called European sites.

In Wales the condition of designated habitats and species features in SAC and SPAs are reported over six-year cycles. This reporting approach differs between England and Wales. In England condition is reported on a unit basis and Wales on a designated habitat or species feature basis. In addition, there are slight differences to some of the categories used for reporting. In Wales NRW has undertaken marine indicative condition assessments for all the marine SPA and SAC features in 2018.

NRW's Freshwater and Terrestrial Protected Sites baseline assessment (2020) used existing evidence to derive, where possible, indicative feature condition assessments across the range of freshwater and terrestrial features on protected sites in Wales.

In January 2021 NRW published an evidence report titled Compliance Assessment of Welsh River SACs against Phosphorus Targets. The evidence review shows that overall,

phosphorus breaches are widespread within the River Dee SAC against the revised tightened targets set. Further information is available in Section 3.2.4.1

Note that the Dee Estuary / Aber Dyfrdwy SAC; Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SAC and River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC are in both England and Wales. Berwyn SPA is not included in these figures as it is not linked to the Dee RBD using NRW revised methodology for the third cycle (to avoid double counting), it is linked to the Severn RBD. The extended Liverpool Bay SPA is linked to the North West RBD, the Dee RBD and Western Wales RBD and is included in the figures above.

Maps of the protected areas in the English part of the Dee RBD and information on compliance with their standards and objectives is available on the Water Watch Wales.

2.3.1 Changes to some of the Protected Areas between second and third cycles

There have been no changes to the designated Shellfish, Bathing waters or Nutrient Sensitive Area's under the Urban Wastewater Treatment (England and Wales) Regulations 1994 between the second and third cycle in the Dee RBD.

2.3.1.1 Drinking water (surface water and groundwater)

We have reviewed all of the surface water DrWPA details of the changes can be found in Appendix B of the **Planning Overview Annex (Wales).** There are no changes in the English part of the Dee RBD.

2.3.1.2 Nitrate Vulnerable Zones

In Wales the Nitrate Pollution Prevention (Wales) Regulations (2013) have been revoked and replaced by the Water Resources (Control of Agricultural Pollution)(Wales) Regulations 2021. While the requirements of the Nitrate Regulations only applied to those holdings within a designated Nitrate Vulnerable Zone (NVZ) the majority of measures under the Water Resources (Control of Agricultural Pollution)(Wales) Regulations will apply to all holdings in Wales after the initial transition period.

2.3.1.3 European sites (water dependent SAC, SPA and Ramsar sites)

Post EU Exit, SACs and SPAs in the UK no longer form part of the EU's Natura 2000 ecological network. The Habitats Regulation 2017 as amended have created a national site network on land and at sea, including both the inshore and offshore marine areas in the UK. The national site network includes existing SACs and SPAs and new SACs and SPAs designated under these Regulations.

Maintaining a coherent network of protected sites with overarching conservation objectives is still required in order to fulfil the commitment made by government to maintain environmental protections and continue to meet our international legal obligations, such as the Bern Convention, the Oslo and Paris Conventions (OSPAR), Bonn and Ramsar Conventions.

Designated Wetlands of International Importance (known as Ramsar sites) do not form part of the national site network. Many Ramsar sites overlap with SACs and SPAs and may be designated for the same or different species and habitats. All Ramsar sites remain protected in the same way as SACs and SPAs.

In October 2017 the Liverpool Bay / Bae Lerpwl SPA (UK9020294) was extended. This large SPA overlaps with three RBDs, the North West, Dee and Western Wales RBDs.

2.3.1.4 Shellfish Waters

Shellfish Water Protected Areas have been reviewed and proposed changes consulted upon separately by Welsh Government in 2021. No changes have been made for the Dee West Shellfish Water.

The Protected Area Register has been updated and published as part of the third RBMP and maps updated on Water Watch Wales.

2.4 Delivery of actions 2015 - 2021

Actions taken during the second cycle have collectively contributed to the protection and improvement of the water environment. The actions related to all types of water bodies; rivers, lakes, wetland, groundwater, estuaries and coastal waters including those in Protected Areas. A number of examples including case studies and many of the partnership actions are set out in Appendix 1.

2.4.1 Preventing deterioration

Many of the day-to-day activities of NRW, EA and several of our partners contribute to preventing deterioration of the water environment. For example, the NRW and EA local staff cover a range of activities, including regulatory, enforcement, incident management and advisory, to protect water, land and air. This contributes to preventing deterioration in many water bodies across the RBD. Examples of this work include:

- targeted farm visits, which can be regulatory for cross-compliance, groundwater and NVZ work or provision of advice and guidance on best practice to protect the water environment.
- audits of hydro-electric power installations for compliance with permit conditions.
- audits of waste water treatment works – water company, trade or private.
- pollution prevention and control visits to permitted sites for example poultry units and other major industrial sites including food and drink sector.
- water related INNS management if it affects protected sites features or NRW assets.
- pollution prevention – industrial estates, misconnections, house build and new road schemes.

- attending incidents to stop polluting discharges and where required follow up with a regulatory response where environmental offences have occurred. This can reduce the impacts and prevent future issues occurring.

- pre-application advice and technical input to new permits including hydro-electric power and planning applications including new agricultural storage facilities.

- monitoring land spreading deployments.

- tackling misconnections with water company and local authority.

2.4.2 Programme of Measures

The majority of national measures have been implemented, in general these set the legislative, policy or strategic approach and support, or are critical to local delivery and environmental outcomes, for example, a national ban on using a particular chemical or a national strategy for prioritising and funding the remediation of abandoned mines. They include the Water Industry Investment Programme and local measures for the targeted water bodies. For further detail of target water bodies see Section 2.4.2.1

The exact measures to be put in place are subject to change over time. Changes in the types of measures needed occur for a variety of reasons including, new evidence, changes in water body status, changes in pressure (e.g. cropping patterns), funding availability, Government policy changes, development impacts and climate change. Opportunities to deliver more, or test novel techniques have been acted upon as appropriate for example the Slurry Separator Project which was supported by the Wales WFD Implementation Fund during the second cycle.

Across Wales through the Water Industry Investment Programme Dŵr Cymru/Welsh Water DCWW allocated £65m to achieving the objectives of the WFD Regulations 2017 in their 2015-20 business plan (AMP6), including:

- installing Event Duration Monitoring at all Combined Sewer Overflows (CSOs)

- monitoring as part of the UK Chemicals Investigation Programme (UKCIP)

- WFD Regulations 2017 and Drinking Water Protected Area investigations

- monitoring of flows at Wastewater Treatment Works (WwTW)

The evidence base is being used to inform investment decisions and to influence changes to land use policy in Wales.

In the Dee RBD specifically, DCWW delivered:

- improvements at Cerrigydrudion WwTW in the Nug catchment to meet WFD Regulations 2017 no deterioration requirements

- investigations to understand the impact of their assets on Worthenbury Brook and Pulford Brook

For Hafren Dyfrdwy the focus has been on the benefits of catchment management, improving the raw product before abstraction. Risk assessments were carried out in relation to the presence of pesticides in the River Dee catchment and their potential impact within the on the water treatment works. Dee Valley Water (Hafren Dyfrdwy from 2018), and United Utilities supported a jointly funded programme of catchment management activities to reduce the usage of the pesticides by local landowners and avoid the installation of costly removal treatment.

The programme funded two Catchment Advisors employed by the Welsh Dee Trust to cover the Middle Dee and the Upper Dee catchments. The advisors engaged with landowners, farmers and local pesticide suppliers with the aim of reducing the use of metaldehyde and other problematic pesticides in the catchment. Further detail is provided in Appendix 1, Case Study 5.

2.4.2.1 Wales target water bodies

To focus on improving water body status in the second cycle a number of water bodies were targeted for the implementation of local measures. NRW prioritised improving compliance with good overall status in five water bodies that were moderate/poor and improving one poor water body to moderate in the Dee RBD. A total of nine local measures were identified for the six target water bodies in Wales and five local measures in four water bodies in England to address diffuse and point source pollution, control or manage abstraction and to improve modified habitat. We predicted that the water bodies meeting good or better overall status by 2021 would rise from 27% in 2015 to 35%. The analysis above shows that in 2021, 38% achieved good overall status which is above what we hoped to achieve. Reasons for this are complex. Many of the measures that were put in place with the aim of achieving good status by 2021 may not be realised in the classification untill the water quality and ecology has had time to recover, be monitored and classified.

2.4.2.2 England Catchment Partnerships

In England further details of some of the new approaches and measures for the Tidal Dee and Middle Dee can be found on Water Watch Wales.

2.4.2.3 Investigations

Since the 2015 plans were published, NRW and EA have carried out a programme of investigations in the Dee RBD to find out why many water bodies are not at good status or potential and plan measures to achieve good status/potential. Our knowledge and understanding of the issues affecting water bodies has increased significantly and will continue to develop through the third cycle. As a result, we are now in a better position to work with our partners to identify where the greatest environmental improvements can be made, which will provide the most benefit to everyone.

2.4.2.4 Additional new measures

The Programme of Measures requires regular review to ensure the right actions are being delivered in the right place. During the second cycle new priorities and/or opportunities meant that some actions were reviewed to reflect the needs of the environment at that point in time.

The following new approaches and measures have been introduced:

Working with other organisations to protect and improve our water quality

Since the publication of the second cycle plans, new arrangements have been put in place to work with key organisations, including Welsh Government, and across work areas to protect and enhance our water environment. These include:

Wales Land Management Forum agriculture subgroup was tasked with undertaking root cause analysis to achieve a common understanding of the causes of agricultural pollution and the ways in which these are currently addressed through the investigation, agreement, reporting and delivery on potential solutions, taking an integrated approach, working across organisations.

Wales Water Management Forum purpose is to provide an opportunity for membership organisations to share evidence and explore opportunities for working together collaboratively towards the sustainable management of water in Wales.

Wales Fisheries Forum represents a range of stakeholders with an interest in the freshwater and diadromous fisheries resources of Wales and the work of NRW and others to maintain, improve and develop migratory and freshwater fisheries in Wales.

Measures for agriculture

In April 2021 the Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021 were introduced to reduce losses of pollutants from agriculture to the environment.

Transitional periods for some elements of the regulations are in place to allow farmers time to adapt and ensure compliance. The timetable introduced and enacted within the regulations includes the following measures:

- Nutrient management planning
- Nutrient applications restricted to crop limits
- Closed periods for spreading manufactured and organic nitrogen fertilisers
- Storage capacity for slurry and storage of organic manure

LIFE River Dee Project (see case study in Appendix 1)

WFD Implementation Fund

Welsh Government provided the River Basin Liaison Panels with an opportunity to deliver actions which would “achieve or contribute towards a measurable improvement in water quality in the respective RBDs”. The fund was a total of £220K over two years. Projects included the River Alyn restoration plan, Wych and Worthenbury diffuse pollution work, producing septic tanks guidance and a project starting to prioritise improvements in physically modified rivers. It should be noted that the Liaison Panels in Wales have been replaced by the WWMF.

Wales Capital Fund

Nearly £10M Welsh Government Capital funding was made available in 2020-21 and £9.5M in 2021 -2022 for water quality improvements. This included water quality improvements (such as fencing, chemicals passive monitoring and river restoration), our mine waters programme and fisheries habitat programme.

Complementary to the LIFE Dee River project on-farm interventions, capital project spend to reduce nutrient and sediment inputs into watercourses, either directly through runoff, or indirectly through poor drainage. These on-farm interventions included methods of reducing runoff from yards, installing guttering, soakaways and/or silt traps or new crossings over streams to reduce sediments and nutrients from livestock.

The Environment (Wales) Act 2016 and the Well-being of Future Generations (Wales) Act 2015

See section 1.3 on taking a place-based approach in Wales on details of the overarching aims of the Environment (Wales) Act 2016, Natural Resources Policy and Area Statements and also for the Well-being of Future Generations (Wales) Act 2015.

Kilometres enhanced and protected in the English part of the Dee RBD

Achieving water body status objectives and outcomes for protected areas, species and habitats, is the ultimate aim of river basin planning. However, the lag time between actions being taken and responses in the environment being detected via water body classification results means that the results have not always reflected the work being undertaken to enhance the water environment.

In England kilometres enhanced is a simple and useful indicator of the extent of progress in enhancing and protecting the water environment. It was established by the Environment Agency in 2016 as a new approach to reporting work undertaken to enhance the water environment. It was expanded in 2018 to include work to prevent or reverse deterioration. It captures work done to support the objectives for water body status and protected areas and species.

Kilometres enhanced captures contributions from a range of people and organisations who play their part in resolving complex environmental problems and preventing or reversing worsening conditions.

It covers actions in all types of water body. Enhancements in lakes, coastal and estuarine waters and groundwater are reported as linear kilometres to allow them to be incorporated into the overall ‘kilometres enhanced and kilometres protected’ measure.

In the 11 water bodies in the English part of the Dee River Basin District, a total of 30 actions were taken resulting in 16km of rivers being enhanced (in the period January 2016 and March 2021).

2.5 Challenges in the Dee RBD

In April 2019, the Welsh Government declared a ‘Climate Emergency’ in Wales with the intention of prompting “a wave of action at home and internationally. From our own communities, businesses and organisations to parliaments and Governments around the world”. On the 30th June 2021 the Welsh Government also declared a nature emergency.

The Welsh Government programme of aspirations sets the commitment to embed our response to the climate and nature emergency in everything we do; plus commitments linked to water quality improvement.

Further information on how to adapt to climate change, and how to reduce emissions, is provided in the **Planning Overview Annex (Wales) and Planning Overview (Dee in England)**.

Since the second cycle RBMP was published in 2015, we have continued to improve our understanding of the pressures, impacts and risks that the water environment faces. There continues to be many challenges for the water environment and the integration of this work will be key during the third cycle.

We have:

- Investigated failures to achieve standards to identify the underlying reason for failure.
- Assessed the risk of deterioration or of failing to achieve standards in this and future plans.
- Consulted the public on our findings though the Challenges and Choices consultation and consultation on the draft third cycle plan.
- Considered current and emerging challenges in particular those that have been identified by stakeholders. These have been used to inform the updated programme of measures to address a broad range of challenges including phosphorous in SAC rivers, spills from storm overflows and taking a more integrated approach for catchments from source to sea.

We have reviewed the list of the most important issues we believe threaten the current and potential future uses of the water environment. We have grouped the pressures under a number of issue headings known as the Significant Water Management Issues (SWMIs) (note that these are not in order of priority). more detail can be found in the **Planning Overview Annex (Wales).** We have focused on those issues where more action is needed to achieve status objectives.

- **Physical modifications**. Man-made changes to the natural habitat, for example poorly designed or redundant flood defences and weirs, and changes to the natural river channels for land drainage and navigation and shellfisheries on estuaries and in coastal waters. These modifications can cause changes to natural flow levels, excessive build-up of sediment, and the loss of the habitat that wildlife needs to thrive
- **Pollution from sewage and wastewater**. Wastewater can contain large amounts of nutrients (such as phosphorus and nitrates), ammonia, bacteria and other damaging substances
- **Pollution from towns, cities and transport.** Rainwater running over manmade surfaces and carrying pollutants into waters, toxic substances from contaminated

land, atmospheric pollution causing acidification and sewage from houses misconnected to surface water drains rather than sewers

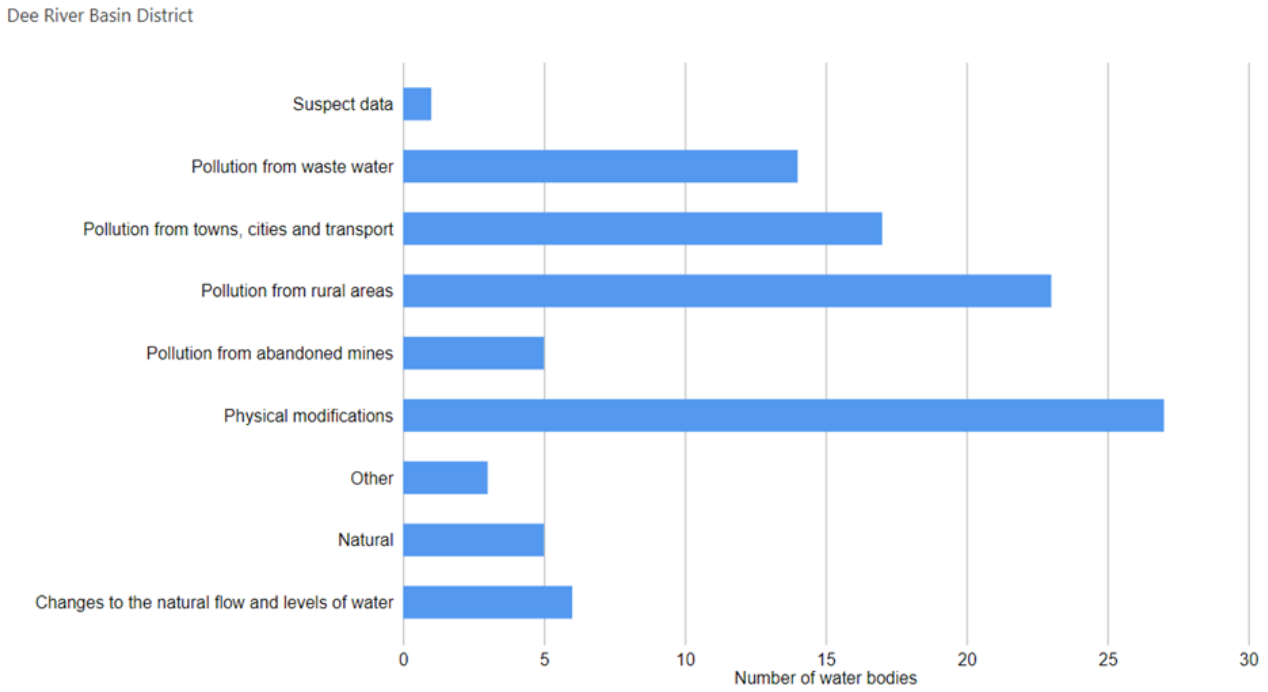
- **Pollution from rural areas.** Poor agricultural practice and forestry can result in nutrients and sediments affecting the water environment (also known as diffuse rural pollution)
- **Pollution from mines**. Contaminated water draining from mines, most of which are now abandoned
- **Changes to the natural flow and levels of water.** Taking too much water from rivers lakes and underground causes problems for wildlife and reduces the water available for people to use
- **Invasive Non-Native Species.** The presence of invasive non-native plants and animals in our watercourses poses a threat to biodiversity, increases flood risk, affects the state of our water environment and costs the economy billions per annum

2.5.1 Reasons for not achieving good status/potential

Since 2015, NRW and the EA have carried out several investigations in the Dee RBD to increase our understanding of the issues affecting water bodies. As a result, we are now in a better position to work with our partners to deliver sustainable improvements.

Figure 8 below provides an indication of the types of pressures acting on our water bodies, which in turn highlight the issues or challenges preventing water bodies achieving good status or potential in the Dee RBD. This Figure represents a snapshot in time, as further investigations are undertaken and measures completed on the ground the dataset is updated. The July 2022 data shows that the main reasons for not achieving good status in descending order; physical modifications, pollution from rural areas, pollution from towns, cities and transport, pollution from wastewater and changes to the natural flow and levels of water.

Figure 8. Reasons for not achieving good status/potential 2021



Note: There are failures due to suspect data which we are working to resolve. Other failures can include the time needed for the ecology to recover after intervention and where natural barriers such as waterfalls limit fish movement. There are also some unknown reasons for not achieving good where we are unable to identify the reason for failure or the investigation was incomplete at the time of writing (these have not been included in the graph)

2.6 Risk assessments

In Wales we have reviewed water quality data and information on the types and magnitude of pressures affecting water bodies in the RBD with the objective of:

- Assessing how susceptible water bodies are to those pressures and. in particular
- Estimating the likelihood of water bodies failing to meet their environmental quality objectives in the future or deteriorating from their current condition

The methodology for each risk assessments (arcgis.com) was tailored to the specific pressure, but in general, it was an assessment of the scale of the pressure and the sensitivity of the water body. The risk assessments are available for the pressures presented on Table 13 below, and are valid until 2027, including those last reviewed in the second cycle in 2014 which were assessed over a longer term so did not require updating.

Table 13 List of available risk assessments per pressure type and water category

Environmental pressure	Water category	Latest review
Phosphates	Rivers and lakes	2019, updated 2021

Environmental pressure	Water category	Latest review
Chemicals and metals	Rivers, lakes, groundwater, estuarine and coastal waters	2019 (2014 for chemicals and metals in groundwater)
Dissolved inorganic nitrogen	Estuarine and coastal waters	2019
Dissolved oxygen and ammonia	Rivers	2019
Physical modification	Rivers	2022
Faecal indicator organisms	Shellfish and Bathing Water Protected Areas	2014
Acidification	Lakes, rivers	2014
Abstraction and flow	Rivers, groundwater	2014
Invasive non-native species	Rivers, lakes, estuarine and coastal waters	2014
Sediment	Rivers	2014

We use the risk assessments to:

- Identify areas and pressures where more data is needed to develop and prioritise our monitoring strategy
- Support the development of national programmes of measures, particularly for pressures where classification data is missing

In England the current risk assessments have been reviewed and have been assessed as appropriate. Details can be found in the **Planning Overview (Dee in England).**

3. Measures and Objectives

3.1 Summary of the Programme of Measures

This section summaries the main Programme of Measures to deliver the statutory objectives:

- **Prevent deterioration in status -** Water body status will not be allowed to deteriorate.

- **Achieve the objectives for Protected Areas -** Achieve the standards set by the relevant legislation under which they were designated. For water dependent European sites we will continue to work towards achieving the conservation objectives. Achieving good status by 2027 will contribute towards meeting those objectives.

- **Aim to achieve good overall status/potential for surface waters and ground waters** - Implement measures to achieve good overall status where they are technically feasible and not disproportionately costly.

To do this will require combinations of measures which are delivered across many sectors as well as by the general public – we all have a role to play. The RBMP considers the measures that are necessary and the mechanisms by which they are delivered, further details on these mechanisms can be found in the **Planning Overview Annex (Wales) and Planning Overview (Dee in England)**. These measures enable us to address the challenges that threaten current and future uses of the water environment and to maintain and enhance the water environment.

In Wales, a summary of strategic measures and water body (local) actions that are planned for delivery includes:

- strategic measures - these usually apply to the whole of Wales, England and Wales, or the United Kingdom. In general these set the legislative, policy or strategic approach and support, or are critical to local delivery and environmental outcomes. They also include some of the main delivery programmes which are summarised in Section 3.2. For example, a national ban on using a particular chemical or a national strategy for prioritising and funding the remediation of abandoned mines. More detail is available on Water Watch Wales.

- local actions – those actions that have been identified locally that are required to deliver WFD Regulations 2017 outcomes, wider benefits to the water environment and contribute to well-being goals. Many of the local actions will be associated with the strategic measures. For example, undertaking investigative work to resolve pollution within Drinking Water Protected Areas, the removal of invasive plants along a length of designated river or progressing recommendations set out within River Restoration Plans. Opportunity Catchment actions are included here and form a significant area of work for the RBMPs. Actions for A/HMWBs are a specific set of mitigation measures dependent on use for example removal of a culvert for urbanisation use. More detail specifically for Opportunity Catchments is available on Water Watch Wales.

Local actions have been categorised as:

- Local Actions (Committed) – these are those actions that aim to deliver WFD Regulations 2017 objectives, wider benefits to water and/or for people where there is certainty around funding, resources, partnerships and/or timelines.

- Future Aims (Potential Local Action) – the Future Aims are more aspirational, flexible measures where there is less certainty around implementation. These will be reviewed within the third cycle and will evolve during 2021-2027 cycle. Progress against these aspirational measures will depend on such things as securing adequate funding, developing the right partnerships etc and may change should further evidence or information come to light. The **Planning Overview Annex (Wales)** contains more detailed information on the approach taken and what is different for the third cycle.

In England some of the measures planned for delivery for the English part of the Dee RBD are available on Water Watch Wales. They include:

- planned measures where funding has been committed or there is an established funding mechanism, and there is confidence about where and when the outcomes will be achieved
    - this confidence is reflected in some of the water body objectives set in the plans
    - these measures are a small subset of the programmes of measures
    - the outcomes they deliver represent a conservative view of what will be achieved by 2027

The Catchment Based Approach promotes collaborative working at a catchment scale for environmental, social and economic benefits. The Tidal Dee and Middle Dee Catchment Partnerships catchment pages on Water Watch Wales, summarise some of the measures the partnerships plan to take forward, improving and enhancing actions and the environment through collaboration with multiple sectors and communities.

3.2 Main Delivery programmes

The Programme of Measures and environmental outcomes they aim to achieve will be delivered through a number of existing programmes and mechanisms. The following section provides a summary of the main programmes. Further detail on all the mechanisms is within the **Planning Overview Annex (Wales) and Mechanisms Summary (Dee in England),** further supporting documentation will also be used for the implementation of the RBMPs to support tracking.

The main programmes in this document include:

- Welsh Governments Water Strategy for Wales
- NRW's WFD Regulations 2017 driven programme

- Catchment scale improvements, River Restoration and Sustainable Fisheries opportunities in Wales and the Catchment Based Approach in England
- Protected Areas including the Wales SAC Rivers Project
- Flood and coastal risk management
- Water Industry Investment Programme including the Wales storm overflow roadmap
- Water resources sustainability measures
- Sustainable land management - agriculture
- Sustainable land management - Woodland and forestry
- Welsh Governments Capital fund
- UK Government new initiatives in England
- Opportunity Catchments

We will take a source to sea, based approach in integrating these programmes to maximise the opportunities we can gain from the source of our rivers to the sea. Working in place-based way enables this approach, but we hope to develop this further in the following cycle.

3.2.1 Welsh Government Water Strategy for Wales

The Water Strategy for Wales was launched in May 2015. The vision is to ensure that Wales continues to have a thriving water environment which is sustainably managed to support healthy communities, flourishing businesses and the environment. The strategy sets out the direction for long term water policy in the context of the Environment (Wales) Act 2016 and Well-being of Future Generations (Wales) Act 2015. The Welsh Government is working closely with key stakeholders in identifying the areas which require an update and revision. The review, with stakeholder input is expected to be progressed in 2022.

The Strategy is due to be revised to take into account more recent scientific, social and political changes which affect the water environment and our water sector.

The existing strategy is accompanied by an action plan with milestones up to 2025 (and beyond). The policy priorities are:

- supporting the development of the area-based approach to natural resource management
- ensuring access to fair and affordable water and sewerage services
- devolution of all matters relating to water and sewerage
- a more focused approach to sewerage and drainage management and development and implementation of legislation to support sustainable drainage solutions

- reform of the abstraction licence system in Wales to ensure sustainable management of our water resources now and in the future

- review and where appropriate change current practices and regulatory approaches to tackle diffuse pollution

3.2.2 NRW's WFD Regulations 2017 driven programme

NRW is committed to delivering statutory objectives through an integrated approach to natural resources and catchment management across its functions. For 2021-2027, we have worked to develop an affordable Programme of Measures, based upon our current understanding of existing resources.

There will be a focus on:

- Preventing deterioration in all water bodies – through the NRW core activities, including incident response

- Identifying where element level improvements will be achieved during the cycle, but where further measures will be required to deliver an overall ecological status change

- Continuing to develop our approach to natural resource management by working at a local catchment level and capturing the wider benefits delivered for WFD Regulations 2017 through Opportunity Catchments

- Targeting actions locally in an integrated way to deliver environmental improvements in water bodies and Protected Areas, including areas protected for water dependent habitats and species through Area Statements and SMNR

3.2.3 Catchment scale improvements, River Restoration and Sustainable Fisheries opportunities in Wales and the Catchment Based Approach in England

NRW is currently developing an integrated River Restoration Programme to bring together related work across Wales. The aim is to take a nature-based approach to restore characteristic river habitat for the benefit of hydromorphology, water quality, biodiversity, fisheries and flood regulation. The focus of this work can be defined as: the re-establishment of natural physical processes (e.g. variation of flow and sediment movement), features (e.g. sediment size and river shape) and physical habitats of a river system (including submerged, bank and floodplain areas).

There are several strands to the River Restoration Programme including prioritisation of water bodies for restoration works, production of a series of strategic river restoration plans for priority rivers including SAC rivers, collation of activity data and development of best practice case studies. There are strong links to Opportunity Catchments, Area Statements and the Fisheries Habitat Restoration Plans which focus on physical habitat constraints to fish populations.

More information about River Restoration is available in section 2.2.5 of the **Planning Overview Annex (Wales)**.

In addition to the River Restoration Programme, the Sustainable Fisheries Programme (SFP) covers several different, but related objectives for fish stocks and fisheries. These include:

- the SFP itself, which is a small fund provided by Welsh Government to deliver a range of outcomes including fish habitat improvements and fishery promotion
- a programme of alternative mitigation providing river habitat improvements as an alternative to migratory salmonid artificial rearing and stocking initiatives that NRW has now ceased
- occasional other sources of funding for delivery of fish habitat restoration

These initiatives are supported and managed by NRW and look to continue previous works (delivered in RBMP cycles one (2009-2015) and two (2015-2021)) initiating new projects across Wales to improve fish stocks and habitat. NRW works closely with Afonydd Cymru and the family of six Rivers Trusts in Wales, as described in the Memorandum of Understanding between the parties, to develop and deliver the Sustainable Fisheries programme.

In England, catchment partnerships play an important role in protecting and improving the local water environment. In the Dee RBD there are two partnerships, the Tidal Dee and Middle Dee. Members of partnerships pool evidence to help determine local priorities and target local action. They work together to implement a variety of actions, including tackling urban and rural diffuse water pollution and undertaking habitat restoration projects across catchments. Catchment partnerships utilise a range of funding opportunities to resource their project work, including the EAs Environment Programme. Catchment pages summarising the actions in each partnership are available for the Tidal Dee and Middle Dee catchments on Water Watch Wales.

3.2.4 Protected Areas

We want to ensure that Protected Areas meet the standards and objectives that apply to them. Some projects and measures have been developed specifically for Protected Areas not currently meeting their objectives.

The Programme of Measures includes a wide range of measures to protect and improve:

- Drinking Waters
- Shellfish Waters
- Bathing Waters
- Nutrient sensitive areas (Urban Waste Water Treatment Regulations)
- European sites

More detail is available in the **Planning Overview Annex (Wales).**

Additional information on the measures and objectives for European sites in Wales can be found in the core management plans and the Regulation 37 marine equivalent.

In England measures for European site protected areas are expressed through a range of actions required to restore the water dependent aspects of the habitats and species at the individual site level.

For the sites of special scientific interest underlying each European site, Natural England records remedies on its site management database. Remedies describe the actions needed to restore the site to, and maintain it in, favourable condition.

Remedies represent the recognised plan of action that forms the basis of the programme of measures for European sites. Major stakeholders responsible for delivering the actions have access to the database. Information about remedies for individual sites is available on request from enquiries@naturalengland.org.uk.

In addition, site improvement plans provide an overview of the longer-term issues that need to be addressed on European sites. They are available on Natural England's Access to Evidence database under the Improvement Programme for England's Natura 2000 Sites project.

Where Natural England advises that nutrients are causing failure of European site objectives, new development, such as housing, must be at least nutrient neutral. Developers, water companies and others need to work together to implement sustainable measures such as constructed wetlands. This will enable development to take place until longer-term measures to restore the European site are possible.

In England, national level measures for European site protected areas are identified in the programmes of measures. They are also described in more detail in the European site protected areas: challenges for the water environment document.

The Habitats Regulations Assessment (HRA), published alongside the plan, assesses the strategic and committed Programme of Measures to ensure there are no unintended consequences of its implementation, such that in benefitting some features we are not impacting on others.

3.2.4.1 Wales SAC Rivers Project

In January 2021 NRW published an evidence report titled Compliance Assessment of Welsh River SACs against Phosphorous Targets This includes the River Dee SAC. The evidence review shows that overall, phosphorus breaches are widespread within the river SACs against the revised tightened targets set. The Court of Justice of the European Union (CJEU) judgment on the 'Dutch Nitrogen' cases affects the assessment of plans and projects under the Habitats Regulations. As a result of the decision the scope for authorising new development that will lead to additional nutrient loading is likely to be limited where the conservation status of the SAC is unfavourable due to nutrient standards being exceeded.

NRW has created a SAC Rivers Project to focus on the water quality issues in our designated rivers. We are working alongside partners in Welsh Government, Planning Authorities, Land Managers, Water Companies and others to determine the best way of addressing the situation nationally though the Welsh Government Oversight Group and Planning sub-group. In addition locally Nutrient Management Boards are being established for the SAC rivers. The role of the Boards will be to identify and deliver actions that deliver

water quality improvements in the River SACs. In the first instance this will focus on the phosphate conservation targets. Membership on the Boards will vary according to local needs, but typically will include; Local Authorities, NRW, Environment Agency, Natural England, Dwr Cymru/Welsh Water and the National Park Authorities (if applicable). The primary mechanism for achieving this will be through the delivery of a Nutrient Management Plan.

Five workstreams have been set up to undertake the work required which include:

- providing planning advice and position statements
- water quality compliance assessments
- water quality improvements
- monitoring and evidence
- permitting and land spreading

For further information about the work see our web site;
Natural Resources Wales / Water quality in river Special Areas of Conservation

3.2.5 Flood and coastal risk management

Flood Risk Management (FRM) activity contributes to NRWs overall purpose by managing the risk of flooding to the people and communities of Wales and increasing community resilience, both for the present day and for the future.

The NRW FRM Service as a whole, includes all activity carried out by NRW in accordance with duties and responsibilities assigned by Welsh Government and legislation. At a high level FRM activities are considered to include:

- Management of flood risk assets
- Delivery of the Hydrometry and Telemetry service
- Community Engagement and Resilience
- Understanding and analysing flood risk
- Advising planners, consenting and enforcement
- Providing strategic advice and oversight

FRM activity seeks to reduce flood risk to the communities of Wales through reduction of inappropriate development within at risk areas, prevention of flooding using defences and the management of catchments and watercourses and moving people and property to safety at times of extreme weather by making communities more aware and resilient before, during and after flooding. The above activities come together to deliver these outcomes and therefore none in isolation address the risk of flooding entirely for any community at risk.

Through NRW's Flood and Coastal Risk Management capital investment and routine maintenance programmes we manage flood risk in several ways:

- By building new flood alleviation schemes and other structures such as sluices and pumping stations
- By maintaining defences and structures once built, keeping them in good condition, and repairing or improving them if and when required
- By maintaining main river watercourses, removing obstructions, vegetation and silt or gravel, to keep water flowing and remove significant flooding risks
- Work on habitats to mitigate and compensate for the detrimental impacts of flood defences

Each of these activities are underpinned by our efforts to understand flood risk through our flood risk mapping and modelling work. We undertake our flood risk maintenance and capital work by having regard to climate change, the Well-being of Future Generations Act 2015 and the Environment (Wales) Act 2016. We integrate SMNR, nature-based solutions and natural flood management into our schemes to deliver sustainable schemes which maintain or where possible improve ecological status or potential.

3.2.5.1 The Flood Risk Regulations

The purpose of the Flood Risk Regulations is for NRW and Lead Local Flood Authorities (LLFAs) to understand what is at risk of flooding and to plan what is needed to be done to manage the risk. This involves assessing what water courses and coastlines are at risk of flooding (the Preliminary Flood Risk Assessment), map the flood extent, assets and humans at risk in these areas (Flood Hazard and Flood Risk maps) and to take adequate and coordinated measures to reduce the risk (Flood Risk Management Plans (FRMP)) on a six year cycle.

We are currently drafting the second cycle FRMPs, once complete, will sit alongside the third cycle RBMPs. Both plans will jointly include measures that aim to improve the water environment in Wales.

In England, the EA are responsible for working with LLFAs to prepare and review FRMPs. The National Flood and Coastal Risk Management Strategy for England was adopted by parliament in September 2020. It sets out the vision for 'A nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100.' It also sets out practical measures to be implemented by risk management authorities, partners and communities, which will contribute to longer term delivery objectives and realisation of the vision. The strategy promotes working with natural processes through nature-based solutions to help mitigate flood risk.

These measures provide significant opportunities to deliver RBMP outcomes (e.g. improved habitat), in addition to reducing flood risk. The EA has therefore been working to align RBMP and FRMP planning to ensure engagement with stakeholders to develop both sets of plans is as streamed lined as possible. However, due to the coronavirus pandemic the EA has needed to delay the consultation on the draft FRMPs for the English parts of the Dee until after that for the England draft RBMPs. We are also aligning as far as

possible our Environment and Flood and Coastal Erosion Risk Management (FCERM) Programmes at the local scale.

3.2.6 Water industry investment programme

In DCWW's 2020-25 business plan (AMP7) £218M has been allocated to delivering their statutory environmental requirements aiming to deliver 418km of river improvements across their operating area. The programme includes investigations and targeted investment to reduce the impacts of high spilling CSOs, UK Chemicals Investigation Programme third phase (UKCIP3), and further investment at WwTWs to meet Urban Wastewater Treatment (England and Wales) Regulations 1994 requirements. Evidence from AMP7 investigations will inform investment decisions and development of the Company's new Drainage and Wastewater Management Plan which will be published in draft for consultation in 2022.

In the Dee, for the third cycle DCWW aim to deliver:

- Schemes to meet WFD Regulations 2017 no deterioration requirements (Cilcain Pantymwyn, Mold, Ty Gwyn and Rhosesmor WwTWs)
- The River Alyn SMNR pilot catchment, where DCWW will look to explore innovative approaches to addressing the impacts of their assets
- Improvement schemes to meet Urban Waste Water Treatment (England and Wales) Regulations 1994 flow requirements (Mold, Ty Gwyn, Gresford, Queensferry)
- A further four schemes are being assessed before confirming whether investment is required: Llanuwchllyn, Lavister, Mold and Ty Gwyn WwTWs

DCWW is actively pursuing moving from the carbon intensive 'grey' concrete type solutions to nature-based solutions such as wetlands where these can be accommodated, for example at small WwTW's which require nutrient reductions to be made. These will form part of their SMNR approach.

In England, the National Framework for Water Resources (March 2020) explores England's long term water needs, setting out the scale of action needed to ensure resilient supplies and an improved water environment. It marks a move to strategic regional planning. It sets out the principles, expectations and challenges for 5 regional groups (made up of the 17 English water companies, DCWW and other water users). These have been developed and agreed by the regional groups, other major water abstractors, Government, regulators and stakeholders. This joined up approach is needed to address the scale of challenges we face from increasing demand driven by population change, and changes to supply driven by climate change. While the National Framework is focused on England, any proposals that may affect Wales, will have due regard to the interests of Wales, sustainable management of its natural resources and welsh legislation and policies.

We need regional planning because the statutory water company Water Resource Management Plans alone are unlikely to provide the right strategic solutions for the whole nation. They address how the company will develop water resources for its customers'

needs only. The national framework puts aside water company boundaries and considers the needs of the whole region and of other water users. It looks at how these needs fit with the national water picture and how we can provide the resilience and environmental protection needed. Cross regional management of water resources will be an increasingly important part of Programme of Measures to manage future pressures on water.

As highlighted above, the Environment Act includes specific initiatives to further support sustainable water resource management. The Act includes new requirements for Water Company planning for future water supply, wastewater and drainage networks, enabling more resilient solutions to drought and flooding.

3.2.6.1 Wales storm overflow roadmap

NRW, Welsh Government, Ofwat, DCWW and Hafren Dyfrdwy (the partner organisations) have established a taskforce to investigate and evaluate the current approach to the management and regulation of storm overflows in Wales. Afonydd Cymru and Consumer Council for Water are providing independent advice to the taskforce, offering key insight and challenge from a stakeholder and customer perspective.

The goal is to:

- Reduce the adverse impact of any overflow discharges on the environment, taking regulatory action where required to deliver improvements
- Gather greater evidence of the impact on our rivers, estuaries and coastal waters through improved monitoring of both the discharge and the receiving water
- Work with the public and stakeholders to improve the understanding and role of overflows in Wales

3.2.7 Water resources sustainability measures

An abstraction licence is needed before abstraction of water of more than 20 cubic metres a day per source of supply can take place (unless exempt from licensing). An impoundment licence is needed where flow is impeded or obstructed (impounded) by the construction, alteration, repair or removal of an impoundment (unless exempt from licensing). These licences are regulated in Wales by NRW and in England by EA. Both maintain a register of all abstraction and impoundment licence applications and subsequent decisions which can be viewed externally via the public register.

Water resource availability assessments will continue to be updated and improved so that the most up to date water resource availability picture is available to customers wishing to apply for an abstraction licence, in the form of published Abstraction Licensing Strategies (ALS). ALS will continue to underpin our abstraction and impoundment licence determination decisions.

Where older abstraction licences are found to be failing to meet statutory objectives, a review of the licence is undertaken by NRW and/or EA. Measures to mitigate, revoke or reduce that abstraction or catchment management measures are then put in place to comply with a minimum objective of no deterioration, as required by the WFD Regulations 2017.

Since 1 January 2018, most previously exempt water abstractors (if taking over 20 cubic metres a day per source of supply) require a licence to continue legally abstracting water. This affects abstractions for purposes such trickle irrigation, navigation, dewatering and those abstractions that take place in geographically exempt areas. Between 1 January 2017 and 31 December 2019 in Wales, extended to 30 June 2020 in England, NRW and EA offered a simpler transitional application process for existing previously exempt abstractors. NRW and EA must determine all transitional applications by 31 December 2022. Some abstractions and impoundments that are considered low risk remain exempt.

NRW in Wales and EA in England are responsible for checking compliance on a risk basis with licences, providing advice and guidance and taking protective responses including issuing notices, civil sanctions or enforcement action. Compliance of abstractions will support the SMNR and enhance resilience of the environment to meet statutory objectives.

Sustainable management of water resources face challenges to flow regimes as a result of climate change, more intensive rainfall and longer drier periods, mean that some existing licences are likely to become problematic in the future as surface water courses and groundwater levels fall, UK Climate Change Risk Assessment 2017.

In future, abstractions will be regulated under the Environmental Permitting (England and Wales) Regulations 2016. This reform of the licensing system provides the opportunity to build in long term flexibility to deal with current and future challenges of climate change, population and economic growth, and to build water efficiency measures into water use across all sectors.

The UK Climate Change Risk Assessment projects increased frequency and intensity of extreme weather events. Existing pressures on water resources, demand due to population growth and urban development, are also likely to increase as well as the carbon footprint for treatment and supply of water. A major tool to mitigate these pressures is to improve the efficient use of water across all sectors.

The Wales Water Efficiency Group and the UK Water Efficiency Strategic Steering Group work collaboratively to promote consistent messaging and water efficiency initiatives across the UK, raising awareness of the need to conserve water.

3.2.8 Sustainable land management - agriculture

NRW continues to work with the sector to co-produce a strategic approach in line with our regulatory principles and our principles to deliver SMNR to tackle agricultural pollution. This has produced an approach which has five themes which in combination will be far more effective than if any theme is taken forward in isolation, more detail is available in the **Planning Overview Annex (Wales)**. These are Regulation; Voluntary actions; Advice, guidance, knowledge; Skills and experience development; Investment and Innovation. These are reflected in the approach developed by the WLMF Sub-Group on Agricultural Pollution in their progress report Tackling Agricultural Pollution.

The Agriculture (Wales) Bill will form the primary, long term legislation foundation for Welsh agriculture and sustainable land management policy and regulation, replacing the Common Agricultural Policy and UK Agriculture Act 2020. The Bill and subsequent secondary legislation provide an opportunity to make provision for a number of important areas in relation to the themes.

In England farmers must comply with regulations such as the Farming Rules for Water. These apply to manufactured fertiliser and all organic manures, including farm manure and slurry, sewage sludge (biosolids) and imported waste organic materials spread to land.

If they go beyond these basic requirements, the government will fund additional environmental outcomes through schemes such as Countryside Stewardship and the government's new environment land management schemes. They also help the environment through voluntary approaches and partnership projects. Ensuring effective enforcement of farming rules will be particularly important to deliver the objectives of this plan, as will effective advice through schemes such as Catchment Sensitive Farming.

Rural land management measures will support climate change resilience, for example, by planting trees next to rivers and streams, which can reduce river temperature and the risk to salmonid fisheries. Protecting soil, peat and moorlands also help store carbon. They will also reduce sedimentation of rivers, making rivers better able to store more flood water. In the appropriate locations the growth of energy crops can provide a sustainable energy source for hydrogen and electricity production, as well as wider benefits to flooding, water and soil quality.

In England implementation of the UK Government's new environment land management schemes will play a major part in delivering the environmental objectives of this plan. Increasing the amount of funding from the private sector (for example, food and retail supply chain through farm assurance schemes) will also be important to help farmers reduce their impacts and make a positive contribution towards a healthier water environment.

3.2.9 Sustainable land management - Woodland and forestry in Wales

Well maintained culverts, effective silt traps, roadside drains separate from any natural watercourses, riparian zones and appropriate water management within the forest are essential to prevent deterioration in status in water bodies linked to the Welsh Government's Woodland Estate (WGWE).

NRW are committed to constantly improving the environmental quality of WGWE. We are continuing to address pressures on water quality and quantity through compliance with the UK Forestry Standard (UKFS) published in 2017 (and supporting practice guides "Managing forestry operations to protect the water environment" and "Managing forests in acid sensitive water catchments"). All harvesting, restocking and engineering work on the WGWE requires a Water Management Plan.

Forest Resource Plans set out the 25-year vision and a 10-year plan of operations for a forest. They present the opportunity to enhance the water environment through designating riparian zones which will become permanent features, identifying areas for management under Low Impact Silvicultural Systems through a progressive thinning regime, and assessing areas of deep peat to determine whether they are suitable for restoration.

Forest Resource Plans are implemented through Coupe Plans, produced to manage forest operations. This is the stage when Water Management Plans are drawn up, to ensure the work has no significant impact on water quality. All work must comply with the UKFS.

In addition, where additional funding is identified, projects provide excellent opportunities to improve the water environment, such as river restoration.

3.2.10 Welsh Governments Capital fund

The priorities areas for the Welsh Government Capital Programme for Water are Metal Mines, Water Quality, Peatlands and Fisheries. The proposed Welsh Government capital delivery programme for water quality in 2022-23 tackles some of the key issues that threaten the water environment and prevent Wales from achieving its WFD Regulations 2017 objectives. These issues are physical modification, pollution from sewage and wastewater, pollution from towns, cities and transport, pollution from rural area and pollution from mines.

In addition to taking action to achieve WFD Regulations 2017 objectives, the programme is underpinned by the legislative requirements of The Environment (Wales) Act 2016 and also considers our duty under the Well-being of Future Generation (Wales) Act 2015. The aim is to deliver projects that have clear, measurable capital outputs that will contribute to the protection and improvement of the wider water environment including benefits to wildlife and people in these key areas:

- Opportunity Catchments
- River Restoration Programme
- Water Quality improvements in WFD Protected Areas (including SAC Rivers, Bathing Waters etc)
- National Projects - e.g., those that apply to all-Wales such as Marine projects

Overall, the Water Capital Programme for 2022-23 reflects NRW's commitment to achieving SMNR for Water in Wales. As this is a long-term objective, NRWs approach will be to continue to deliver capital projects that benefit the water environment and people beyond 2022/23.

3.2.11 UK Government new initiatives in England

UK Government is developing a series of interdependent initiatives which will play a critical role in achieving the environmental objectives of the RBMPs. The Environment Act 2021 will deliver long term targets for water and biodiversity. The targets will be used to drive progress to address some of the challenges affecting the waters in the river basin districts. Water quality targets for four of the challenges are being considered:

- pollution from agriculture and rural areas, in particular agricultural sources of nitrogen, phosphorus and sediment
- pollution from water industry waste water, in particular phosphorus
- changes to water levels and flows, in particular reducing water demand, including leakage, household and non-household water consumption
- pollution from abandoned metal mines

Biodiversity targets are also being considered which will help protect and improve aspects of the water environment. These include a target which will support the achievement of favourable conservation status for sites of special scientific interest (including water-dependent sites), and a wider habitat creation target which will include aquatic and water-dependent habitats.

Establishing a Nature Recovery Network to improve the landscape's resilience to climate change, provide natural solutions to reduce carbon, manage flood risk, and sustain ecosystems such as clean water, clean air and improved soil.

Developing Local Nature Recovery Strategies under the Environment Act 2021 to support the Nature Recovery Network. The strategies are designed as tools to drive more coordinated, practical and focussed action to help nature. Each strategy will, for the area that it covers:

- map the most valuable existing habitat for nature
- map specific proposals for creating or improving habitat for nature and wider environmental goals
- agree priorities for nature's recovery

Local Nature Recovery Strategies are intended to deliver nature-based solutions and wider environmental benefits. Rivers, lakes, estuaries, coastal habitat, and other water dependent natural habitat, including wetlands, saltmarshes and peatland, are expected to feature strongly in these strategies.

Committing £640 million to England's Nature for Climate Fund. This fund will help support the delivery of the England Tree Action Plan and the England Peat Action Plan. Both action plans will help create catchments more resilient to climate change and deliver nature-based solutions that directly improve the quality of the water environment. Opportunities for estuarine and coastal habitat (saltmarsh and seagrass) creation to absorb carbon are also being explored.

Developing Environmental Land Management schemes to pay land managers for delivering public goods. Through these schemes, farmers and other land managers may enter into agreements to be paid for delivering outcomes including improved water quality, habitat protection and creation, species recovery, natural flood management and carbon capture.

3.2.12 Opportunity Catchments

For the third cycle RBMPs we aim to achieve a place-based approach to catchment prioritisation that also delivers WFD Regulations 2017 outcomes. We have not selected targeted water bodies solely for the purpose of delivering outcomes under WFD Regulations 2017 but have identified ten catchments that represent the best suite of opportunities to deliver sustainable management for water and contribute to the well-being goals. The Area Statement engagement process was central to the selection of these 'Opportunity Catchments'. In addition, the Area Statement process will continue post 2027 and therefore integration will bring WFD Regulations 2017 benefits for the longer term. Ten Opportunity Catchments have been identified across Wales and represent the strongest

mix of opportunities for delivering SMNR for water within each place using a catchment to coast approach.

Opportunity Catchments will focus staff resource across NRW's functions to support partners to deliver integrated catchment management solutions. Partners operating within the ten Opportunity Catchments will also be able to contribute towards improvements within these areas. NRW will continue to work with partners in other catchments that are not selected as an Opportunity Catchment including focussing on addressing physical modifications, fisheries restoration plans, metal mine remediation and pollution from wastewater, and rural and urban areas.

The ten Opportunity Catchment areas are shown in Figure 9:

- Dee (Wales only)
- Clwyd
- Conwy
- Anglesey
- Teifi
- Taff/Ely
- Cleddau/Milford Haven
- Swansea Bay
- Central Monmouthshire
- Ithon

Figure 9: Map of Wales' ten Opportunity Catchments

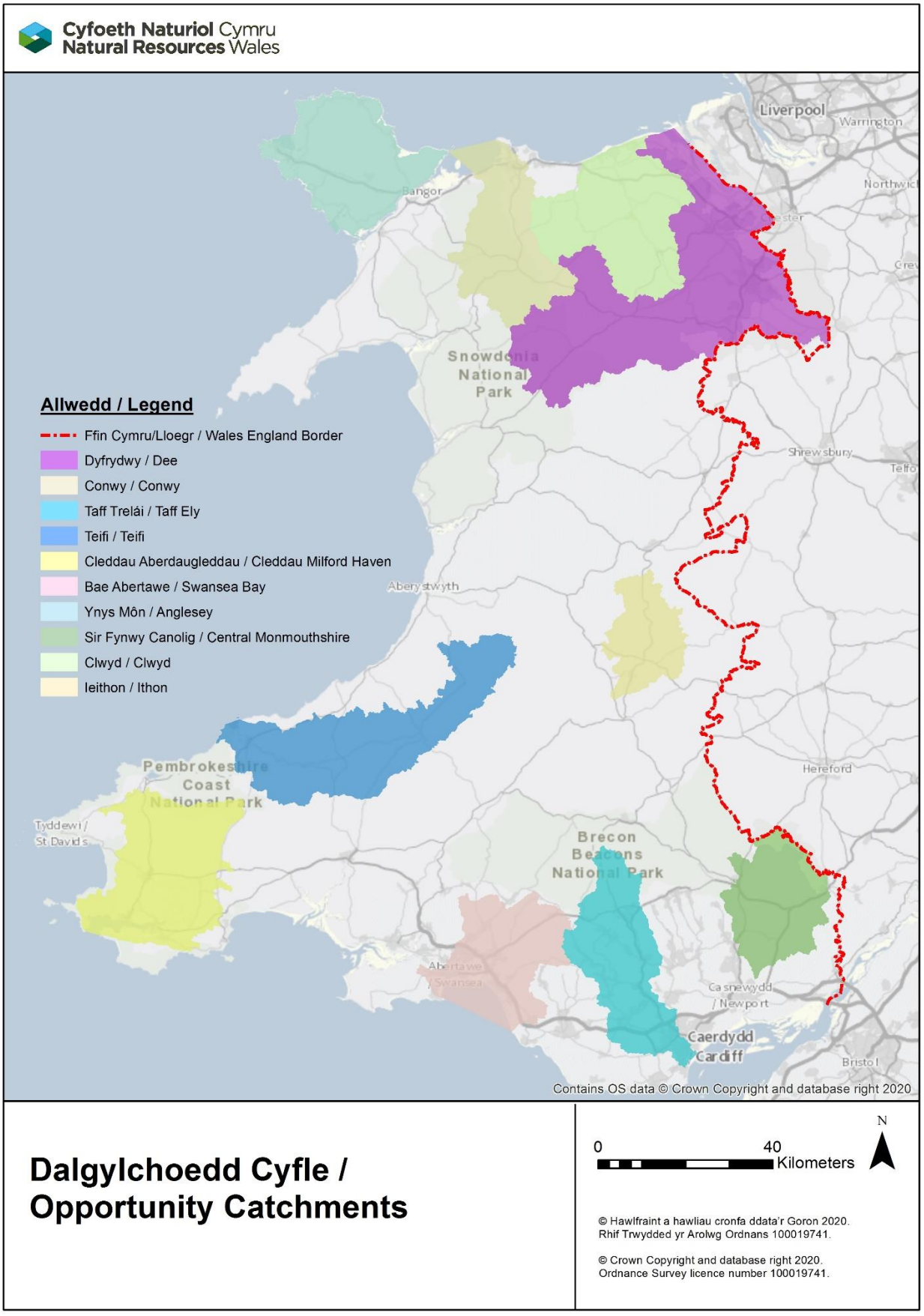


Table 14: Percentage of water bodies in the Dee Opportunity Catchment meeting good overall status by water body type (2021 classification data)

Opportunity Catchment name	River water bodies good status (%)	Lake water bodies good status (%)	Coastal water bodies good status (%)	Transitional water bodies good status (%)	Groundwater bodies good status (%)	All water bodies good status (%)
Dee (Wales only)	49	24	n/a	0	67	45

Nutrients, chemicals and physical pressures at the coast are the most significant pressures that result in failure to achieve good status in estuarine and coastal waters. The wider opportunities provided through Area Statements and the wider framework of marine planning now established provides additional focus on estuarine, coastal and marine waters and the link to their freshwater catchments. The Opportunity Catchments chosen for the third cycle have fully applied the source to sea approach to catchment management and identified estuarine and coastal water bodies where a sustainable management approach to water will be progressed. All catchment based actions identified for the RBMP which contribute to progress towards Good Environmental Status of marine waters. The UK Marine Strategy Regulations 2010 will require necessary measures to be taken to achieve Good Environmental Status and Marine Strategy Part Three: UK proposal for programme of measures went out to consultation between September and November 2021.

3.3 Opportunity Catchment in the Dee RBD (Wales only)

The Welsh part of the Dee has been identified as an Opportunity Catchment due to its unique status; it is the largest river in North Wales, is highly regulated with three major drinking water supply reservoirs and drinking water abstractions, is rich in biodiversity and has several designations such as SAC, SSSI, SPA and Ramsar. The Dee contributes to the local economy through angling and other recreational activities. The majority of the catchment is agricultural with floodplains forming an important function. Significant flood risk areas sit on the Tidal Dee in Queensferry, Sandycroft and Deeside areas.

There are well established catchment partnerships across the whole of the Dee, including the Wales-England cross border Middle and the Tidal Dee, which have coordinated the delivery of successful projects, addressing rural diffuse pollution and delivering river restoration opportunities in some of the sub-catchments. Within the Tidal Dee Catchment projects such as the National Lottery Heritage Fund Project, Our Dee Estuary/Caru Aber Dyfrydwy aims to inspire coastal communities about the natural heritage of the Dee Estuary

Projects such as the LIFE Dee River project, which is a cross border EU LIFE five year funded project, aims to restore natural processes and functions to increase the resilience of the freshwater habitat of the River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid

SAC.

Water bodies in the Dee Opportunity Catchment are affected by issues including acidification, metal and coal mine impacts, diffuse rural pollution from agriculture and forestry, sewage discharges from wastewater treatment works, intermittent discharges (i.e., combined sewer overflows, storm tanks and pumping station overflows), areas away from mains sewerage, physical modifications impacting on hydrogeomorphology, protected features and fish migration and INNS. Priority issues also include protected features which are not at favourable conservation status, deprived communities and communities at risk of flooding, flow regulation and releases from reservoirs, meeting abstraction demands in response to increasing water use and climate change pressures and taking an integrated approach to catchment to flood risk management.

By building momentum and operating on a catchment scale, NRW can pursue opportunities that provide WFD Regulations and the river SAC improvements, whilst supporting the themes of the North West, North East and Marine Area Statements to deliver benefits to water quality, people and wildlife within the Dee. The Opportunity Catchment approach will encourage the application of SMNR principles to all projects delivered by NRW and partners within the Dee, improving links with Well-being Plans and continued cross border work with English organisations (such as the EA and Natural England).

Common opportunities within the Area Statements and the Opportunity Catchment include river restoration, improving water quality and access to water through nature-based solutions and sustainable land management.

3.4. Setting Objectives for the third cycle

3.4.1 Welsh water bodies

This plan sets out what we intend to achieve by 2027. This is identified by setting an objective for each water body. The detailed outcomes of this information can be accessed at **Water Watch Wales** and a more detailed description of our approach is provided in the **Planning Overview Annex (Wales)**.

As required under the Regulations we aim to implement measures to achieve good overall status/potential for surface and groundwaters by 2027. Alternatives to that objective are allowable which may result in two additional options:

- an objective of less than good by 2027 (less stringent objective) due to technical infeasibility (no known technical solution is available) or disproportionate cost (unfavourable balance of costs and benefits)

- or an extended deadline of good status/potential beyond 2027 for reasons of natural conditions (ecological recovery) or technical infeasibility for a small number of chemicals

We continue to apply the same methodology for setting objectives for the third cycle that we did for the first two cycles, i.e. predict what will be achieved by the end of the cycle. However, in the third cycle there are limitations which specify that an extended deadline may only be justified for reasons of natural conditions (with the exception of a small number of priority substances).

For each Protected Area, other than Shellfish Water protected areas, the objective is to achieve compliance with any standards/targets and objectives required by the relevant Regulations for which the area or body of water is protected. For European sites the objective is to achieve favourable condition. Where two or more objectives apply to the same body of water, or the same part of a body of water, the most stringent objective applies. When setting a WFD Regulations objective for a water body that is at less that good status, it is not acceptable for the WFD Regulations objective to undermine those of other protected areas such as European sites.

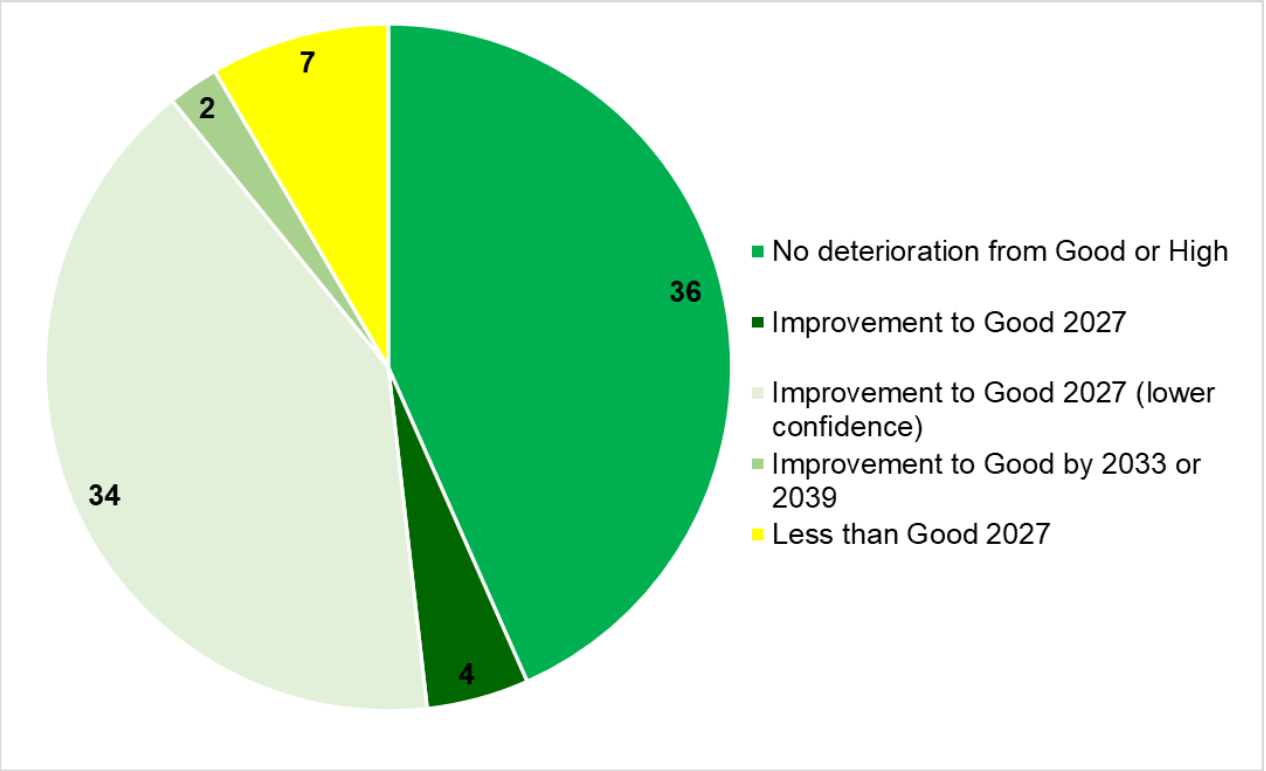
For the third cycle, where there is spatial/physical overlap between the river line; transitional; coastal; lake and water dependent European sites (including marine sites) we have considered these to be co-located. For these water bodies we have not set less stringent than good status or potential for reasons of technical feasibility or disproportionate cost. We recognise that activities that occur within water bodies that are upstream, but outside of the designation area of water dependent European sites, can have downstream effects. NRW has an ongoing programme of work to establish the contribution of the wider catchment effects on water dependent European sites and we anticipate that in following iterations of RBMP's we will amend objectives in the wider catchment accordingly. Such activities including discharges and abstraction will be subject to the requirements of the Habitats Regulations 2017 as amended.

All objectives must be reviewed for every planning cycle as new evidence and measures to resolve environmental pressures become available.

Figure 10 shows that of the 83 water bodies in the Welsh part of the Dee RBD, 36 are at good status/potential and therefore have an objective of no deterioration over the third cycle. 2 water bodies are expected to improve to good by 2027, and an additional 4 water bodies have a delayed objective of Good by 2033 for reasons of acidification or for mercury where the measures to achieve good have been taken but recovery will take longer than 2027. Of the water bodies that are currently at less that good status/potential, the majority have an objective of good, but it is believed that the reasons for not achieving good are yet to be confidently identified or the measures may not to be in place by 2027. It is intended that the investigations programme will help provide more definitive objectives for these water bodies over the third cycle. This results in 76 water bodies (92%) having an objective of good status/potential by 2027, however at present we are only confident that 37 will achieve or remain at good (43%).

Finally, 7 water bodies have a less than good status/potential objective on the basis of them being disproportionately costly, or technically infeasible to improve to good status over the third cycle. In all 7 water bodies some national and local measures will be taken to improve the water quality and contribute towards SMNR values and if significant SMNR values would be accrued, or downstream catchment benefits gained as a result of further intervention, then they will be encouraged. However, it is unlikely that measures over one cycle will be sufficient to result in a classification status change.

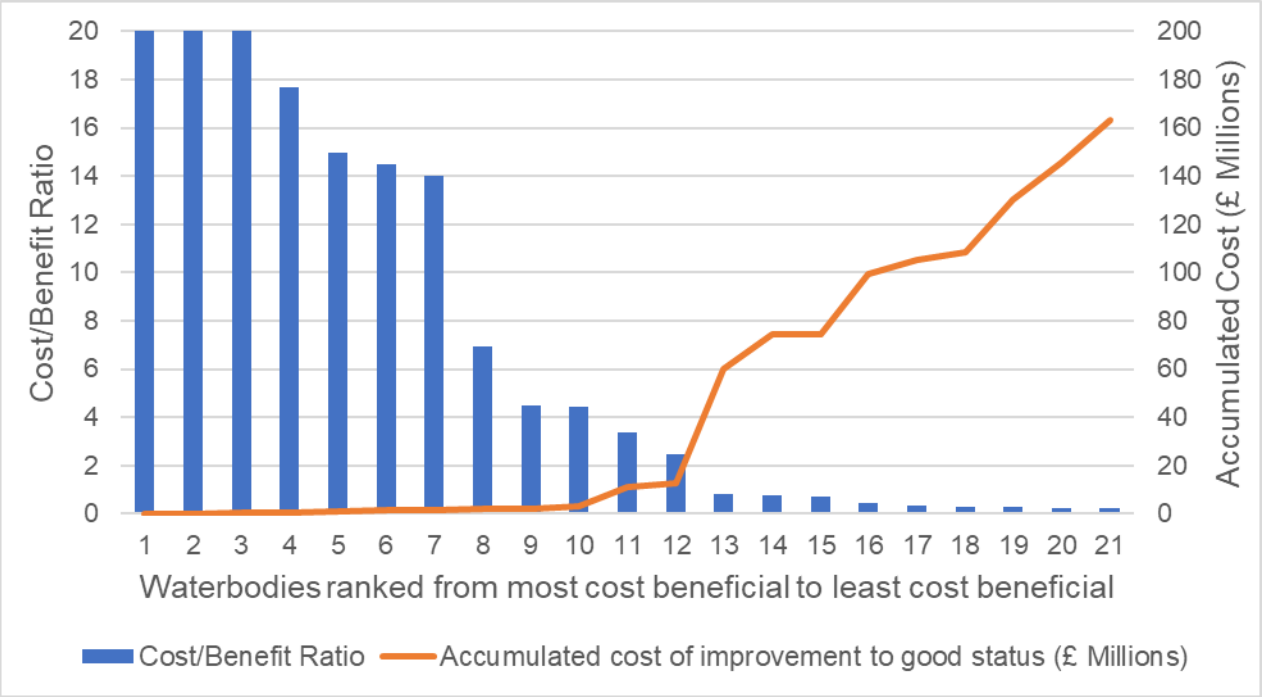
Figure 10: Number of water bodies and objective categories for Welsh part of Dee RBD.



The disproportionate cost assessment has been made on 18 water bodies which we have been able to collate costs for. Since publication of the second RBMP, the Environment (Wales) Act 2016 and Well-being of Future Generations (Wales) Act 2015 allows us to consider benefits of improvement in water quality that the benefits valuation for the WFD Regulations 2017 may not include such as using mine water remediation to heat local homes. For this reason, measures in water bodies that are calculated to be disproportionately costly for the WFD Regulations 2017 requirement may still be progressed if it is demonstrated that there are wider and significant SMNR values that would be accrued.

Figure 11 shows the 21 water bodies considered for economic assessment which are ranked on the x axis from the most cost beneficial to improve to the least cost beneficial to improve. There are 9 water bodies which have a cost benefit ratio of less than 1 although 7 of those are associated with European sites and so retain an objective of good status. The 2 water bodies not directly associated with European sites that are considered to be disproportionately costly to improve tend to be lower in the catchment and have multiple pressures causing the water bodies to not achieve good status. These will be considered further due to their proximity to European sites to ensure a catchment-based approach is taken for regulation and improvement. The overall cost of improving the water bodies for which we have costs is £163 million. The actual cost of improving all water bodies is likely to be significantly larger, however the cost to improve those 14 water bodies which are not disproportionately costly is £13 million. To improve these water bodies also requires other factors such as access and regulatory tools to be available, and that the pressures are also technically feasible to be resolved.

Figure 11: Economic assessment of improving water bodies to good status.



3.4.2 English water bodies

The water body status objectives set in the 2015 river basin management plan have been reviewed and, where relevant, updated, based on the latest evidence and understanding.

For surface waters, objectives are proposed for ecological and chemical status. For artificial or heavily modified water bodies, objectives are proposed for ecological potential and chemical status. Ecological potential is further explained in **Planning Overview (Dee in England)**. For groundwater, objectives are proposed for quantitative and chemical status.

Status objectives consist of a target status (for example, good) and a target date by which that status is expected to be achieved (for example, by 2021).

The default objective for river basin planning was to aim to achieve good status or potential by 2015. In some cases, alternative objectives have been set. These either involve taking an extended time period to reach the target status (for example, good by 2027) or achieving a target status less than good.

Where the target date is 2027, confidence in achieving the target status by that date depends, in part, on having confidence that the necessary actions will be in place before then. Where this confidence is low, the target date is expressed as ‘by 2027 (low confidence)’.

For many programmes of measures, although there is confidence that they will be implemented by 2027, it is not yet known which actions will take place and where. The outcomes from these programmes of measures are therefore not reflected in the water body status objectives proposed for achievement by 2027.

In addition, by 2027 there will be many additional opportunities for further action and improvements which it is not yet possible to identify. Some chemicals, known as ubiquitous persistent, bioaccumulative and toxic (uPBT) substances, can remain in the water environment for decades after actions to reduce or eliminate emissions are in place. The target date for achieving good status for some of these chemicals, where required actions are already in place, reflects this extended recovery time.

The requirement to prevent deterioration was also considered when reviewing and proposing updated water body status objectives.

Irrespective of the current proposed objective, the long-term objective remains “aim to achieve good status”. Therefore, even if the current proposed target status for a water body is less than good, proposals for new developments and strategic long-term planning processes, such as water resources planning by the water industry, should be designed to achieve good status (subject to regulation 19 of the WFD Regulations).

More information on water body status objectives, including alternative objectives, can be found in the **Planning Overview (Dee in England)**.

Eight out of the ten surface water bodies in the English part of the RBD have an objective of good ecological status, with seven of these having an extended deadline of achieving good ecological status by 2027 (low confidence). The remaining two river water bodies have less stringent objectives of poor or moderate ecological status.

The chemical status objective for all ten river water bodies has been updated to one of achieving good chemical status by 2063, driven by the time needed for the status of mercury and PBDEs to recover to good (2040 and 2063 respectively).

The single groundwater in the English part of the RBD has an objective of good by 2015 for both chemical and quantitative status.

4. Implementation and where we want to be by 2027

4.1 Implementation in Wales

The focus for the third RBMP is to continue to protect and improve the quality of water in Wales, including Protected Areas. This will depend on a number of factors including funding levels from both public and private finances, commitment to delivery and availability of delivery mechanisms. The Programme of Measures will address multiple issues across Wales which will progressively reduce the number of elements failing in water bodies and will improve the overall condition of water bodies over time. The objective across Wales by 2027 is to improve overall condition of water bodies where possible, prevent deterioration and, where resources allow, ensure that even those water bodies that do not achieve good status will be under the least pressure possible.

By 2027 we will:

- Deliver projects funded by the Welsh Government capital funding programmes
- Deliver the Dee Opportunity Catchment and complete local actions
- Seek to address catchment scale improvements through river restoration and sustainable fisheries opportunities
- Deliver the planned investigations programme to inform our understanding of the problem so that appropriate actions can be taken through existing measures and local actions, maximising on opportunities that arise during this third cycle
- Continue to address current and emerging challenges to address a broad range of pressures including phosphorous in SAC rivers, spills from storm overflows and taking a more integrated approach for catchments from source to sea
- Deliver the LIFE Dee River project in Wales
- Finalise mitigation measures assessments in some of the Heavily Modified Water Bodies

We will take an SMNR approach for the third cycle plans to deliver more integrated catchment benefits in line with the priorities for water identified within Area Statements applying the source to sea approach to catchment management. The Programme for Government also makes a commitment to begin designation of Wales' inland waters for recreation and strengthening water quality monitoring. Improving water quality is a key driver of this commitment which also offers opportunities for supporting the wellbeing of Wales' citizens and a more diverse use of our waterways by local communities.

NRW cannot deliver on the RBMP alone and therefore we need to build on existing partnerships to deliver solutions to the environmental pressures.

4.2 Implementation in England

When carrying out activities that can affect the Dee RBD, public bodies have a legal duty to have due regard to this RBMP. However, to achieve the environmental objectives in the plan, the whole of society needs to play its part.

This plan contains a summary of the programmes of measures to protect and improve the water environment. In some cases, the detailed and specific on-the-ground actions (exactly what will happen, where and when) have already been identified and agreed. In other cases, the on-the-ground actions will be identified and agreed during the lifetime of the plans. Where flexibility exists, when implementing the programmes of measures and when choosing specific actions, the following principles should be followed:

- take a collaborative place-based approach - align initiatives on water, and pool resources to achieve more than partners can achieve alone
- make evidence led decisions - work with partners to build the evidence base and use it to make evidence led decisions that are explicit about the intended benefits of actions and transparent about the assumptions used
- take account of future and changing risks to delivery - in particular, the effects of climate change and population growth to make sure actions perform as intended over their lifetime
    - consider a range of possible futures (for example 2°C and 4°C temperature rise by 2100) and use flexible approaches that enable solutions to be modified in the light of changing circumstances or new information
    - contribute to net zero - minimise greenhouse gas emissions and maximise carbon capture aiming for net zero
    - restoration of the natural environment offers the potential to deliver carbon sequestration as well as other benefits
    - many partners have already committed to ambitious net zero targets
- build catchments resilient to warmer water temperatures, more frequent floods and drought, and rising sea levels - choose measures that help natural assets cope with or recover from shock
- work with natural processes - where possible choose nature-based solutions to protect and improve natural water assets and deliver multiple benefits
- promote restoration and recovery of freshwater, estuarine and coastal habitats and species - this will provide resilience to climate impacts
- it may also sequester carbon and provide many other benefits for people and wildlife

Adopting these principles will help the water environment better prepare for climate impacts and deliver multiple benefits for people and nature. Public bodies should ensure

the environmental objectives of this plan are reflected in their processes and plans, for example the town and country planning system and statutory local development plans.

4.3 Where do we want to be in Wales by 2027?

This section includes a summary of the programmes and activities to address the significant issues alongside the economic appraisal and objectives and where we want to be by 2027. In many instances, bundles of measures will be required to tackle multiple pressures within the RBD. All require collective action.

4.3.1 Physical modifications

Key programmes and activities include:

- Flood Risk Management activities
- Shoreline Management Plan policy for coastal defence management
- National Habitat Creation Programme
- Sustainable Fisheries Programme
- The Agenda for Change for Fisheries
- Barriers to fish passage
- River Restoration Programme

Economic appraisal and objectives for water bodies not achieving good;

The remediation of physical impacts has been difficult to cost and it is hoped that an improved estimate will be made during the third RBMP. Based on the need to improve fish passage and habitat in the Clywedog – above Black Brook and Glyn water bodies the total cost is £1.4 Million. However the cost throughout the RBD is likely to be much greater. Sandycroft Drain has a cost of £890k to improve physical impacts. In combination with the cost of remediating other pressures, these three water bodies are considered to be disproportionately costly to improve, however because they are associated with water dependent European sites, they remain a priority and they maintain an objective of Good Status by 2027.

Where we want to be by 2027:

- Where modifications to the water environment are essential to society, for example navigation, public water supply, coastal defence or flood management, we want to mitigate harmful impacts as far as possible while protecting those uses
- Deliver the 5-year river restoration programme
- Future modifications do not cause deterioration

- We want to increase the extent of buffer zones and river side corridors alongside inland waters to make them more resilient to other pressures, including climate change

- Target nature-based solutions for physical modifications at some areas on the coast

4.3.2 Managing pollution from sewage and wastewater

Key programmes and activities include:

- Water Company Programme (2020 -2025): Delivery of AMP7 commitments including the SMNR pilot, development of the Drainage and Wastewater Management Plans and investment to meet phosphate standards for SAC Rivers

- Water Company Programme (2025- 2030): Developing the 2025-2030 business plan (AMP8)

- Storm overflow roadmap

- SAC Rivers Project

- Misconnections

- Sustainable Drainage Systems (SuDs)

Economic appraisal and objectives for water bodies not achieving good;

The economic analysis shows that to resolve the wastewater pressures to bring the status of water bodies back to good status results in a total cost of £124 million of which almost all is associated with upgrades to wastewater treatment discharges. In combination with other costs of improvement, 6 out of 11 water bodies considered are calculated to be disproportionately costly to improve, however 4 are associated with European sites and so remain a priority to improve and have an objective of Good status by 2027. The remaining 2 will be further considered because of their proximity to a European site. In the Dee, for the third cycle DCWW aim to deliver:

- 4 schemes to meet WFD Regulations 2017 no deterioration requirements (Cilcain Pantymwyn, Mold, Ty Gwyn and Rhosesmor WwTWs)

- the River Alyn SMNR pilot catchment, where DCWW will look to explore innovative approaches to addressing the impacts of their assets

- 4 improvement schemes to meet Urban Wastewater Treatment (England and Wales) Regulations 1994 flow requirements (Mold, Ty Gwyn, Gresford, Queensferry)

Four additional schemes require further assessment before confirming whether investment is required: Llanuwchllyn WwTWs to meet European site objectives; and Lavister, Mold and Ty Gwyn WwTWs to contribute to good ecological status.

Where we want to be by 2027:

- All sewerage systems including CSOs, are maintained or improved so they operate effectively and their impacts on the water environment, from source to sea are minimised
- Solutions to CSO problems that deliver multiple benefits are embedded in planning and development across Wales (e.g. water sensitive urban design, sustainable drainage schemes)
- Storm overflow roadmap in place
- SAC rivers project- Continue to identify opportunities and deliver interventions to improve water quality through the Dee Nutrient Management Board
- Increase public awareness of the impacts of misconnections and disposal of harmful substances into sewerage systems (e.g. paint, oil, fats and garden chemicals)
- Maintain and improve Bathing and Shellfish Waters to promote a thriving tourism and shellfish aquaculture industry
- Delivery of agreed AMP schemes, including those for the Dee SAC to improve water quality
- Work collaboratively with water companies to support the delivery of sustainable improvements to the water environment, through both the delivery of their statutory environmental requirements (i.e. National Environment Programme (NEP)) and the development of innovative solutions (e.g. SMNR pilot catchments)

4.3.3 Manage pollution from rural areas

Key programmes and activities include:

- Sustainable land management themes
- SAC Rivers project
- Welsh Governments Woodlands for Wales Strategy
- Awareness and implementation of the UK Forestry Standard Guidelines (including “Forests and Water” Guidelines), and Practice Guides

Economic appraisal and objectives for water bodies not achieving good;

The total cost of resolving agricultural pressures by applying current legislation in 13 water bodies has been calculated at £6.5 million. Many of these lowland water bodies also require improvement in wastewater discharges to allow good status to be achieved and when total costs of improvement are considered 6 water bodies are considered to be disproportionately costly to improve to good status. Further consideration of the wider catchment plans and SMNR values should be taken into consideration when planning improvement to agricultural sources of pollution in these water bodies.

Where we want to be by 2027:

- We want to strengthen regulatory, financial and operational mechanisms to support a sustainable agricultural sector that protects the water environment, from source to sea, and helps deliver the full range of ecosystem services that provide financial, social and ecological benefits to Wales.

- SAC rivers project - Continue to identify opportunities and deliver interventions to improve water quality through the Dee Nutrient Management Board.

- Appropriate new woodland creation and forestry management that benefits the water environment, people through outdoor recreation and delivers ecosystem services such as reduced diffuse pollution, reduced flood flows, clean drinking water, habitat for fish and wildlife, and shade in river margins to mitigate the impacts of climate change.

- For those groundwater dependent wetlands that are in a poor ecological condition as a result of high nutrient groundwater inputs we will encourage local changes in catchment management.

- Use the results of the source apportionment work when available to focus local measures with the agricultural sector where appropriate.

- We will manage our Welsh Government Woodland Estate to meet the UK Forest Standard Forest & Water Guidelines as a minimum and tackle metal mine pollution with innovative approaches to remediate the toxic discharges associated with these sites that are on the estate.

- We are identifying and acquiring land for new woodland creation on the WGWE. This is needed to maintain the area of woodland cover on the NRW Estate, between c500ha and 1,800ha is needed over the next 10 years. This is to compensate for woodland area lost from the estate due to renewable energy developments, and the reversion of woodland to valuable open habitats and to ensure that NRW has a net positive contribution to Wales' woodland creation targets.

4.3.4 Managing pollution from mines

Key programmes and activities include:

- Metal Mine Strategy for Wales

- Coal Authority programme of work

Economic appraisal and objectives for water bodies not achieving good;

There are two water bodies failing as a result of metal mines in the Dee RDB. These are Y Garth and Clywedog - above Black Brook, which are impacted from the Nant Minera and Park Day Level discharges. The total cost of improving these water bodies is estimated at ~£24.5M. The majority of those costs are for the metal mine remediation and treatment of discharges, however there are some costs that have not been accurately identified. Y Garth and Clywedog - above Black Brook are assessed to be disproportionately costly to improve to good status, but because the water bodies are associated with European sites

they remain a priority to improve. Our well-being objectives may also have a bearing when considering ecosystem diversity, resilience, culture and community health. To put this cost into context, the funding made available to NRW from Welsh Government to remediate metal mines in financial year 2020 to 2021 was £4.5M across Wales. Prioritisation of metal mines remediation is made on a national basis and takes into account wider practical matters than the cost benefit assessment for WFD Regulations 2017.

Where we want to be by 2027:

- We want to mitigate the impacts of abandoned mines on the water environment through a strategic work programme across Wales. It will take decades to address all the issues and we will prioritise actions that deliver the best ecological, social and economic outcomes for society's investment.

4.3.5 Manage pollution from towns, cities and transport including the impacts of acidification

Key programmes and activities include:

- Diffuse Water Pollution Plan including Pollution Prevention work
- Dee Water Protection Zone
- Water Sensitive Urban Design
- Misconnections
- Contamination from historic industrial and waste sites
- UK Forestry Standard Guidelines (including "Forests and Water" Guidelines), and Practice Guides

Economic appraisal and objectives for water bodies not achieving good;

Upland restoration to contribute to resolving acidification issues in the Alwen - above Afon Brenig and Gelyn water bodies is £2.6 million and are cost beneficial to improve to good status.

An accurate economic appraisal of pollution from towns, cities and transport including the impacts of acidification has not been possible.

Where we want to be by 2027:

- We want to minimise the negative impact of historic and future development on the water environment via our role as a land quality consultee in the planning process or, where the planning process is not applicable, by providing advice and assistance to local authorities with their contaminated land inspection strategy.
- We want to put SMNR at the centre of urban design and planning. By using SuDs, restoring the areas around rivers and coasts including the riverbanks, floodplain and

the intertidal area, providing public green spaces, raising awareness and changing behaviour to improve the quality of life in the urban areas of Wales.

- We want land use practices to contribute to sustainable, long term recovery to natural pH conditions in areas where ecological processes are compromised by acidification. We will continue to regulate emissions of acidifying pollutants to allow the water environment to recover.

4.3.6 Changes to the natural flow and levels of water

Key programmes and activities include:

- Welsh Government National Peatland Restoration Programme
- Flood Risk Management activities
- HMWB mitigation measures review
- Multi-Sector demands project for water saving measures
- Waterwise work on reducing water consumption
- Reducing the amount of water abstracted from sensitive locations by taking water from alternative locations or by reducing demand for water, or both

Where we want to be by 2027:

- We want to continue to deliver the Welsh Government National Peatland Restoration Programme
- We want to encourage sustainable land use patterns in urban and rural environments that reduce runoff from rainfall including nature-based solutions
- We want to deliver interventions such as in-channel habitat improvement that mitigate the impacts of abstraction on the water environment
- We want to better understand the water demands across sectors
- We want to improve water use efficiency to reduce the need for additional abstraction in the future

4.3.7 Managing INNS

Key programmes and activities include:

- Implementing the updated GB strategy on invasive species
- Working with partners and support the development of new and innovative solutions, such as AquaWales and Aquainvade led by Swansea University
- Continue using and promoting mechanisms such as online and smart phone recording systems

Where we want to be by 2027:

- We want to prioritise actions to slow down or prevent the spread of existing invasive species and eradicate these or new introductions where possible to do so
- We also want to minimise the risk posed by INNS generally through improved biosecurity and improved local information on INNS distribution and impact

5. Practical actions that we can all take

There are several steps and practical actions we can all take in our daily lives and at home to collectively protect and potentially improve the quality of our water environment. Some of these are summarised below.

Prevent pollution to our rivers, lakes, groundwater and sea

- Check that household appliances are connected to the foul sewer, not the surface water drain.
- Bin your litter or take it home with you keeping lakes, canals, rivers and our seas free of litter including plastics.
- Adopt-a-beach to help keep beaches clean and stop litter at source.
- Ensure household oil storage is in good condition, with an up-to-date inspection record.
- Ensure septic tanks or private sewage treatment plants are well maintained and working effectively.
- Put cotton buds, wipes and other litter in the bin, not down the toilet. It may end up in the river, on your local beach and in the sea where it can harm wildlife.
- Take waste oil and chemicals such as white spirit to a municipal recycling facility: don't pour them down the sink or outside drains.
- Use kitchen, bathroom and car cleaning products that don't harm the environment, such as phosphate-free laundry detergents, and use as little as possible. This helps prevent pollution at source.
- When you see pollution or fly-tipping, report it on 0300 065 3000 if it is in Wales or 0800 807060 if it is in England.

Protect our marine environment

- Eat fish from sustainable sources, caught using fishing methods that don't cause damage to marine wildlife and habitats.

Save water in your garden

- Choose plants that tolerate dry conditions. To help lawns through dry periods, don't cut them too short,
- To save water in gardens, collect rain in a water-butt, water at the beginning or end of the day, mulch plants, and use watering cans where possible instead of sprinklers or hosepipes,

Save water in your house or office

- Purchase low energy and low water use appliances.

- Ask water companies to fit a meter. On average, this can reduce household water consumption.
- Fix dripping taps, and lag pipes to avoid them bursting in freezing weather.
- Hand wash cars.
- Consider installing rainwater harvesting systems in your home, block or workplace. This can save one third of domestic mains water usage.
- Install a 'hippo' or 'save-a-flush' in toilet cisterns.
- Install a low-flush toilet, put flow regulators on your taps and showers, and install waterless urinals at work.
- Run dishwashers or washing machines with a full load on economy setting and boil the minimum amount of water needed in kettles or saucepans.
- Turn off the tap when brushing teeth and take short showers rather than baths.
- Wash fruit and vegetables in a bowl rather than under the running tap - and use the remainder on plants.
- Ensure extensions or conservatories have their roof water draining into a soakaway or sustainable drainage system and are not connected to the combined sewer.
- Ensure that any off-road parking or patio around the house use permeable materials so rain can soak into the soil.

Help tackle the threat of INNS

- Find out how you can get involved in national campaigns (Check, Clean, Dry and Be Plant Wise) to help to reduce the spread of INNS, by checking out the GB Non Native Species secretariat (GBNNSS) website
- Do not buy, plant or release INNS, access the most up to date advice about how to control INNS and dispose of them responsibly through the GBNNSS Website
- You can find out about the location of INNS in Wales through the National Biodiversity Network Atlas Wales INNS Portal
- If you spot an INNS then please record it either online (iRecord or your Local Records Centre, by downloading a recording app (iRecord and Local Environmental Records Centres Wales LERC Wales) or by contacting your local records centre
- Join an environmental group or organisation in your area that takes action to tackle INNS (e.g. wildlife organisations or rivers trusts), also check out the GBNNSS website for the contact details of specific INNS local action groups in your area

Appendix 1

Examples of actions taken during the second cycle for the Dee RBD

Partnership working

Lead	Action
Coal Authority	Ongoing work with Coal Authority at Minera mine (Clywedog catchment) and mines in Trefnant brook and Y Garth water bodies.
Farming Connect	Farming Connect Targeted Campaign to tackle diffuse pollution on the main River Dee (weir to Ceiriog), Dungrey, Pulford, Alyn and Dolfechlas. Three workshops were held to encourage farmers to seek advice on funding options.
Groundwork	Pollution prevention audits project funded by United Utilities. Provision of free confidential pollution prevention advice on storage of chemicals, drainage, emergency procedures to local industries to reduce water pollutions risks.
Hafren Dyfrdwy	Investigated pesticide issues at Broughton Water Treatment Works as part of National Environment Programme (NEP).
Hafren Dyfrdwy	Restoring Sustainable Abstraction investigation in Aldford Brook.
Middle Dee Catchment Partnership (hosted by Welsh Dee Trust)	Farm advisors from the Welsh Dee Trust and Reaseheath College work with the local farming community to improve farming practices and reduce their impact on water quality. A number of techniques were first piloted in two sub-catchments; Alwen (Upper Dee) and Alyn (Middle Dee), but farm advice has also been concentrated in the Aldford Brook, Wych and Worthenbury Brooks and Emral Brook sub-catchments. Over 100 farms have been engaged in these sub-catchments and provided with advice including Water Management Plans, soil testing and Nutrient Management Plans. This included Emral Brook Diffuse pollution project (see case study below).
Natural England	Catchment interventions in the English Dee via Natural England's Countryside Stewardship Scheme.
NRW	NRW funded a topographic survey in Big Pool Wood nature reserve, part of the Dee Estuary Site of Special Scientific Interest (SSSI) and SPA. Results will be used to work with the North Wales Wildlife Trust to manage the area to improve the water management.

Lead	Action
	Since the topographic study was undertaken, an additional groundwater level investigation was undertaken to describe the water level characteristics of this small parcel within the Dee estuary SSSI/SPA/Ramsar site.
North Wales Wildlife Trust	Delivering Living Landscape projects including work to enhance the river Alyn through the Alun and Chwiler Living Landscape and the wider Dee catchment via “Our River Well-being” project which encourages people to work as Volunteer River Guardians to reduce the impact of INNS in the catchment.
Reaseheath College	Ongoing project funded by Water Environment Grant a scheme under the Rural Development Programme for England to fund improvements to the water environment. The project will pay farmers for the ecosystem services that they provide. To receive the payment, a water management plan must be carried out to identify any areas of potential diffuse pollution. Capital works undertaken will produce the required ecosystem service. Cheshire Wildlife Trust have carried out INNS control work.
Snowdonia National Park Authority	Snowdonia National Park Authority are a key partner in the River Dee project originally funded via LIFE and also supported other projects including the new Welsh Raised Bogs project which also originally funded via LIFE. Peatland restoration work has taken place at various locations in the Upper Dee on land managed by National Trust, NRW (Welsh Government woodland estate) and in private ownership. Work has been delivered by both Snowdonia National Park Authority and Royal Society for the Protection of Birds RSPB.
Tidal Dee Catchment Partnership (hosted by Cheshire Wildlife Trust)	Love your Estuary Phase 3. Catchment walkover survey data collated during 2015-2017 was interrogated and hotspots identified. Landowners engaged to raise awareness of diffuse pollution issues emanating from their land. Small scale capital interventions undertaken to improve the classification status of the water bodies.
Tidal Dee Catchment Partnership (hosted by Cheshire Wildlife Trust)	Dee Coastliners is a new Tidal Dee Catchment Partnership project designed to inspire coastal communities on the Wirral, in Flintshire and Denbighshire about the natural heritage of the Dee Estuary. Led by Cheshire Wildlife Trust, the Partnership have received first round project development funding from the Heritage Lottery in December 2018 and are now developing the second-round application.

Lead	Action
United Utilities	Working in partnership, United Utilities has delivered several projects to improve water quality including: • Industrial pollution audits and free pollution prevention advice offered to targeted businesses on Wrexham Industrial Estate. Twenty-four of these businesses accepted the audit offer, and actions were implemented to reduce their risk of pesticide pollution into watercourses • Passive monitoring was undertaken for acid herbicides and metaldehyde using Chemcatchers®. Several schemes have been running aimed at reducing the risk to water quality from these pesticides including subsidised slug pellet switch, waste pesticide amnesty, free weed wiper and aerator hire, free National Sprayer Testing Scheme, subsidised pesticide applicator training within the English areas of the Dee catchment • United Utilities also joint funded projects delivering farm advice and Farm Water Management Plans to help farmers reduce diffuse water pollution, in an initiative that was supported by the EA. These include part funded direct interventions such as fencing out feeder streams, moving toughs and feeders, installing cow tracks and crossings to reduce runoff
Welsh Dee Trust	Delivering a range of river habitat restoration projects to benefit fisheries in the Dee catchment, including the Upper Dee.

Projects

Llyn Tegid

Ensuring Wales' largest natural lake remains safe in the long-term. The lake's embankments, which give vital protection from flooding to the town of Bala, are regularly inspected by NRW to make sure they remain safe. Opportunities to improve the environment and recreation are being explored as the project develops. This includes:

- Continuing the Upper Dee Flow Investigations, with further salmon smolt tagging work ongoing in the Bala area
- River Alyn Restoration Project - see case study below
- Riparian fencing, in-river habitat improvement in sub-catchments, gravel traps and removal of blockage to fish migration in the sub-catchments including the Llafar, Mynach, Hirnant, Lliw and Tryweryn

Welsh Government Sustainable Management Scheme funding (2014-2020) supported collaborative landscape-scale projects delivering action that improves our

natural resources in a way that delivers benefits to farm and rural businesses and rural communities. It supported and facilitated co-ordination with other schemes to undertake the vital action needed to improve the resilience of farm and rural businesses and rural communities to climate impacts. Relevant projects for the Dee RBD include:

- **Our River Well-being: Nature-based solutions in the Dee Catchment**

  The focus of this project spans the entire Dee catchment including several rivers, lakes and reservoirs. The project aims to take actions to improve the natural resources across the catchment and in doing so provide opportunities for people, including long term unemployed and disabled individuals, to learn about and actively take part in land management improvements. The project will develop a 'River Guardian Scheme' to help achieve this.

  The project has already developed a group of collaborating organisations including Dee Valley Area of Outstanding Natural Beauty, NRW, Wildlife Trusts, the Clwydian range and National Park. The main land management activities will be based around helping to improve the INNS issues across the whole catchment that is having a huge impact on the quality of the natural resources and the services these provide. Through a comprehensive baseline survey, the project will then be able to focus and prioritise its activities to tackle this challenge. Work is currently underway to assess and compare the ecosystem service benefits of different woodland habitats.

- **Biodiversity Means Business**

  The focus of this project is centred on the large (550ha) rurally located Wrexham Industrial Estate and its surrounding rural communities. Through a collaborative approach involving businesses, landowners, farmers and community groups the aim is to improve the resilience of the ecosystems across the landscape while making the area positively attractive to businesses and providing easily accessible areas for people to enjoy a range of leisure activities and engaging with their local environment.

- **North Wales Moorland Partnership**

  This collaborative project based in the Berwyn and Migneint in North Wales is taking action on moorland enhancement through bottom-up collaborative action, driven by those living and working on and around the moors so that these uplands are able to help sustain the surrounding rural communities. The landscape has a variety of habitats and is enjoyed by a large number of visitor and communities attracting tourism and business opportunities. The area also experiences challenges such as fly-tipping, vandalism and illegal off-roading.

Case Studies

Case study 1: LIFE Dee River - Restoration of freshwater features River Dee and Bala Lake SAC

The LIFE Dee River project started in September 2019 and will run for 5 years. The total proposed cost is around £7million with match funding by NRW, EA, Dŵr Cymru/Welsh Water (DCWW) and Snowdonia National Park Authority. LIFE Dee River project

Case study 2: River Alyn Restoration Project

The River Alyn is one of the main tributaries of the Dee and is failing to meet good status for Invertebrates, Phytobenthos and Phosphates. NRW commissioned a River Restoration study in 2019 to review and assess restoration options for the Catchment. A partnership approach for the future management of the Alyn catchment already exists with interest from NRW, local angling groups, water companies (DCWW and United Utilities), Welsh Dee Trust, North Wales Wildlife Trust and other partners in the Middle Dee catchment partnership.

The project utilised existing knowledge and has provided an insight into the physical pressures affecting the River Alyn catchment. It has identified restoration options and how they can be applied, for example, the removal of weir structures, reconnection of flood plain features and tackling INNS. The study describes the benefits and constraints for each option. The outcomes of this work are being used for the prioritisation and funding of future restoration measures for the River Alyn.

Case study 3: Diazinon

Routine water quality monitoring on the intake to Llangollen Canal, at Horseshoe Falls, detected raised levels of Diazinon on several occasions during 2017. Diazinon is the active ingredient permitted for use in sheep dip parasite treatment. Anecdotal evidence suggested sheep dipping within the catchment could be increasing. A workshop was arranged for farmers and vets in the catchment covering sheep ectoparasite control. The workshop highlighted the legal requirements and best practices when dipping sheep and was attended by over sixty people. A leaflet endorsed by NRW and EA on safe use of sheep dips is being distributed by United Utilities in the Welsh Dee and Llangollen Canal catchments. Diazinon levels have decreased, and have remained at this decreased level, on the intake to the Llangollen Canal at Horseshoe Falls since this partnership work was initiated. United Utilities continues to monitor the catchment for any trend changes in Diazinon samples.

Case Study 4: Emral Brook Project

The Emral Brook project is addressing diffuse pollution from agriculture by working with farmers and landowners to highlight issues on their farm, provide individual Water Management Plans and deliver interventions to make improvements. It was a two-year partnership project funded by NRW, United Utilities, DCWW, Woodland Trust and in partnership with Welsh Dee Trust, Dee Valley Water and Reaseheath College.

The Emral brook catchment is predominantly rural with livestock farming, especially dairy the main land use. Situated south of Wrexham, it is a tributary to the middle River Dee. Classified as moderate in 2015, it was failing to meet good status, with phosphate the main issue. Twenty-eight farms received detailed plans covering approximately two thirds of the catchment and seven key issues were noted.

Farmer engagement was extremely positive with six successful Glastir Small Grant applications submitted totalling £23,113 and partnership funding to help with key on farm improvements totalling £36,000. On farm improvements included: livestock fencing, relocation of gateways and water troughs, sediment traps, cover crops, new guttering/downpipes and tree planting.

Case Study 5: Middle and Upper Dee Catchment Advisors

Hafren Dyfrdwy and United Utilities supported a jointly funded programme of catchment management activities to reduce the usage of the pesticides by local landowners and avoid the installation of costly removal treatment.

The programme funded two Catchment Advisors employed by the Welsh Dee Trust to cover the Middle Dee and the Upper Dee catchments. The advisors engaged with landowners, farmers and local pesticide suppliers with the aim of reducing the use of metaldehyde and other problematic pesticides in the catchment. They managed and promoted a number of initiatives to meet this aim, including:

- Active monitoring programme through fortnightly distribution of ‘chemcatchers’
- Subsidised MOTs for sprayers and weed wipers
- Free weed wiper hire
- Free pesticide collection and disposal service
- Subsidised ferric phosphate slug pellets to encourage use of these as an alternative to metaldehyde pellets
- Accredited sprayer and weed wiper operation training
- Farm ‘health check’ audits to look for improvements to practices which could reduce pollution risk – for example, slurry storage; site drainage; fencing of fields running adjacent to water bodies to reduce bank damage by cattle.

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