Cyfoeth Naturiol Cymru
Natural Resources Wales

Western Wales River Basin Management Plan 2021 – 2027 Summary

(Version submitted for Ministerial approval 10 May 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 Generation (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.

Contents

Acronyms

Acronym	Meaning
ALS	Abstraction Licensing Strategies
AONB	Area of Outstanding Natural Beauty
A/HMWB	Artificial and heavily modified water bodies
AMP	Asset Management Plan
BRICs	Building Resilience In Catchments
CFF	Carmarthen Fishermen's Federation
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
FWAG	Farming Wildlife Advisory Group
GBNNSS	GB Non-Native Species Secretariat
HEP	Hydro-electric power
HMWB	Heavily Modified Water Body
INNS	Invasive Non-Native Species
LLFA	Lead Local Flood Authority
NEP	National Environment Programme
NGO	Non-Governmental Organisation
NNR	National Nature Reserve
NRP	Natural Resources Policy
NRW	Natural Resources Wales
NVZ	Nitrate Vulnerable Zone
PAH	Polycyclic Aromatic Hydrocarbons
PBDE	Polybrominated Diphenyl Ether
PCNP	Pembrokeshire Coast National Park
PSB	Public Service Boards
RBD	River Basin District
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SMP2	Shoreline Management Plan 2
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

Acronym	Meaning
uPBT	ubiquitous, persistent, bioaccumulative and toxic
WwTW	Wastewater Treatment Works
WFD	Water Framework Directive
WGWE	Welsh Government Woodland Estate
WFF	Wales Fisheries Forum
WLMF	Wales Land Management Forum
WMAAG	Wales Marine Advisory and Action Group
WWMF	Wales Water Management Forum
WWRT	West Wales Rivers Trust

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 Western Wales 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. River basin management is a continuous cycle of planning and delivery (see Figure 1).

Figure 1 River Basin Management Planning Cycles

The purpose of this management plan is to protect and improve the water environment for the wider benefits to people and wildlife. In order to achieve this, the plan includes a summary of the Programme of Measures needed to achieve the objectives of the WFD Regulations 2017 together with the predicted environmental outcomes over the next six years. Collectively, the approach and actions set out in this plan will have an effect on all types of water across the catchments that make up the management plan, this includes rivers, lakes, canals, groundwater, estuaries and coastal waters. The plan aims to be integrated at the catchment scale ensuring a connection across the wider environment for people and wildlife, from catchment to coast.

The environmental objectives in this plan are legally binding and have been submitted to the Minister for Climate Change. 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, further detail can be found in Section 3.6 of the **Planning Overview Annex (Wales)**.

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 Opportunity Catchments 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.

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

Western Wales 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)**.

Water Watch Wales – data, maps and Opportunity Catchments

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 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.

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 and water dependent European sites.

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 Western Wales 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 Western Wales RBMP to lower tier plans, programmes and projects. We are confident that the Western Wales RBMP 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 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

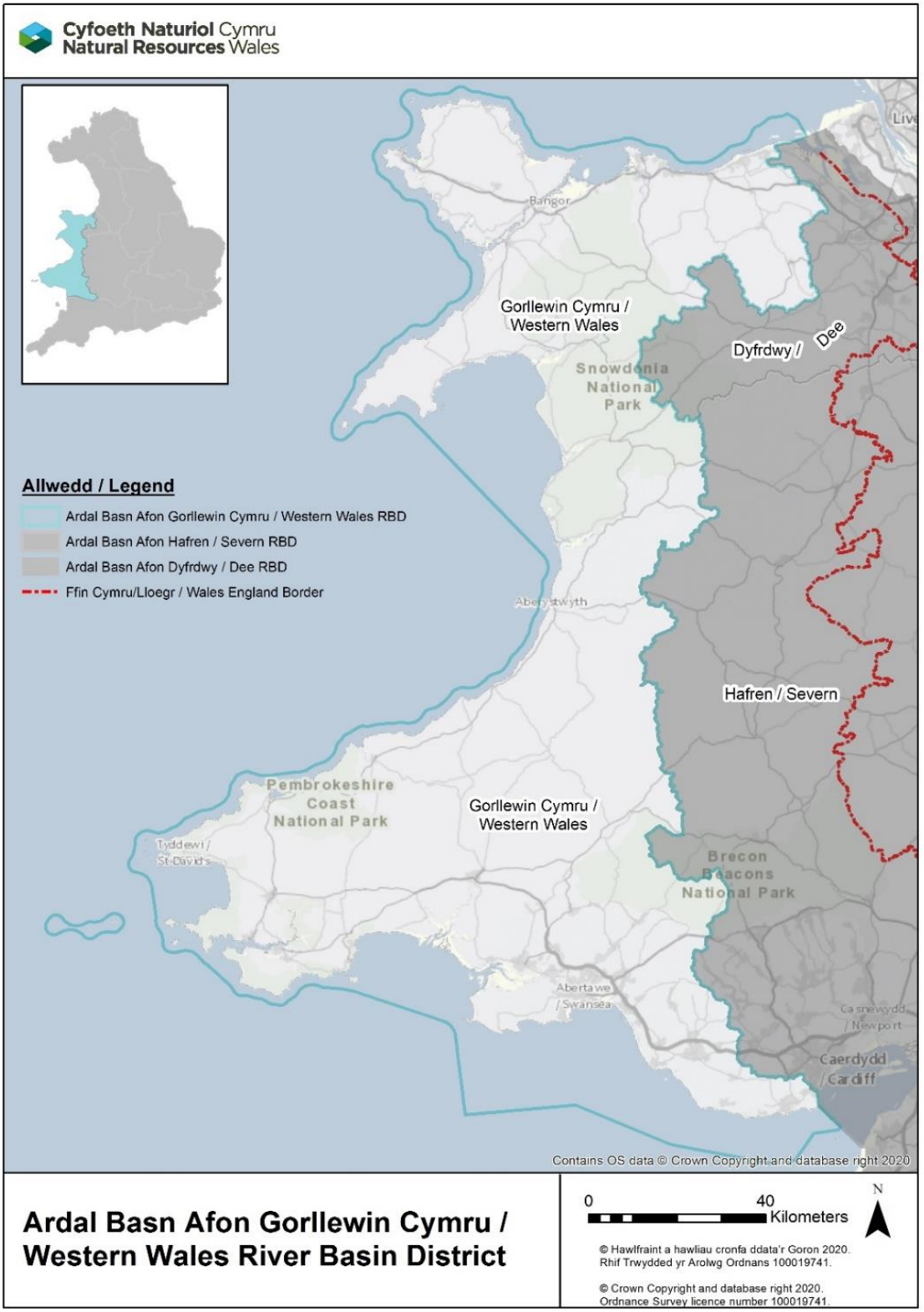
During 2020 and 2021 the Global Covid-19 pandemic and the public health response resulted in lockdowns and restrictions in order to limit the spread of the Covid-19 virus. The Welsh Government exercised its legal powers to make Regulations imposing restrictions or requirements on people with the purpose 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, 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 Western Wales River Basin District

Figure 2 shows the boundary of the Western Wales River Basin District (RBD).

Figure 2 The Western Wales RBD



Responsibility for planning the future of the Western Wales RBD lies with NRW.

The Western Wales RBD covers an area of 16,653 square kilometres. It extends across the entire western half of Wales, from the Vale of Glamorgan in the south to Denbighshire in the north.

The main centres of population are restricted to the coastal strip and the westernmost part of the South Wales valleys. The main urban centres include Swansea, Bridgend and Neath in the south, Aberystwyth on the coast in mid-Wales and the North Wales coast including Colwyn Bay, Rhyl, Llandudno and Bangor. The RBD is primarily rural, with land mainly used for agriculture and forestry. Marine, oil and gas industries remain important economic activities, along with heavy industry such as the steel works at Port Talbot and commercial fisheries, shellfisheries and tourism, notably around the Welsh coastline.

The lakes, rivers, estuarine and coastal waters of the district are renowned for their fishing. Around 70% of the District's coastline is designated in UK law for its environmental quality, including many world class bathing beaches and internationally important conservation sites. All groundwater in this RBD forms part of a Drinking Water Protected Area (DrWPA).

There are large and valuable cockle beds at Traeth Lavan in the north and The Burry Inlet in the south. Mussels are harvested from natural beds in the Conwy and farmed in the Menai Strait. Much of the uplands is given over to livestock farming and commercial forestry. Dairy farming is dominant in the lowlands, particularly in Pembrokeshire and Carmarthenshire. The milder climate of South Pembrokeshire also allows for significant arable production.

The dramatic coast, bathing waters and the proximity of significant population also help explain the importance of the coastal tourism industry which continues to be a major contributor to the Welsh economy. This includes the Wales Coastal Path route which covers 870 miles along the Welsh coastline, the path is one of the few footpaths in the world that follows a nation's coastline - taking you through the Welsh landscape including its heritage and communities.

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 Western Wales RBD has benefited from investment over the past thirty years, and beyond which has delivered improvements which 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 40% of water bodies achieved good or better overall status. The most recent classification shows that this has improved to 42%. 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. 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.

1.2.2 Who manages the Western Wales River Basin District?

There are many organisations which are responsible for managing the RBD. These organisations are often grouped into sectors 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

Sector	Examples
Non-Governmental Organisations (NGOs)	Includes environmental NGOs (including wildlife and river trusts) and other NGOs
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. 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 - from source to sea. It is chaired by a NRW Board Member and meets biannually, 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). WWMF works with the Wales Land Management Forum (WLMF), 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, working across organisations. The group produced a report in April 2018 on tackling agricultural pollution.

1.2.3 Scale within the Western Wales 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, canals, estuaries, coastal waters or groundwaters which we monitor and report on the quality.

Managing the water environment is not always best co-ordinated at the RBD scale. Under the Environment (Wales) Act 2016 boundaries covered by Area Statements have been published (see Figure 5 on page 18) which will be a new way of working and rely on

collaboration with partners and stakeholders. Catchments are still important and will be managed as part of working across Area Statement boundaries.

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 is a regulator, 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. Examples of this include developing our approach to SMNR, Metal Mines Strategy for Wales and the Marine Protected Area Management Action Plan. 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

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.

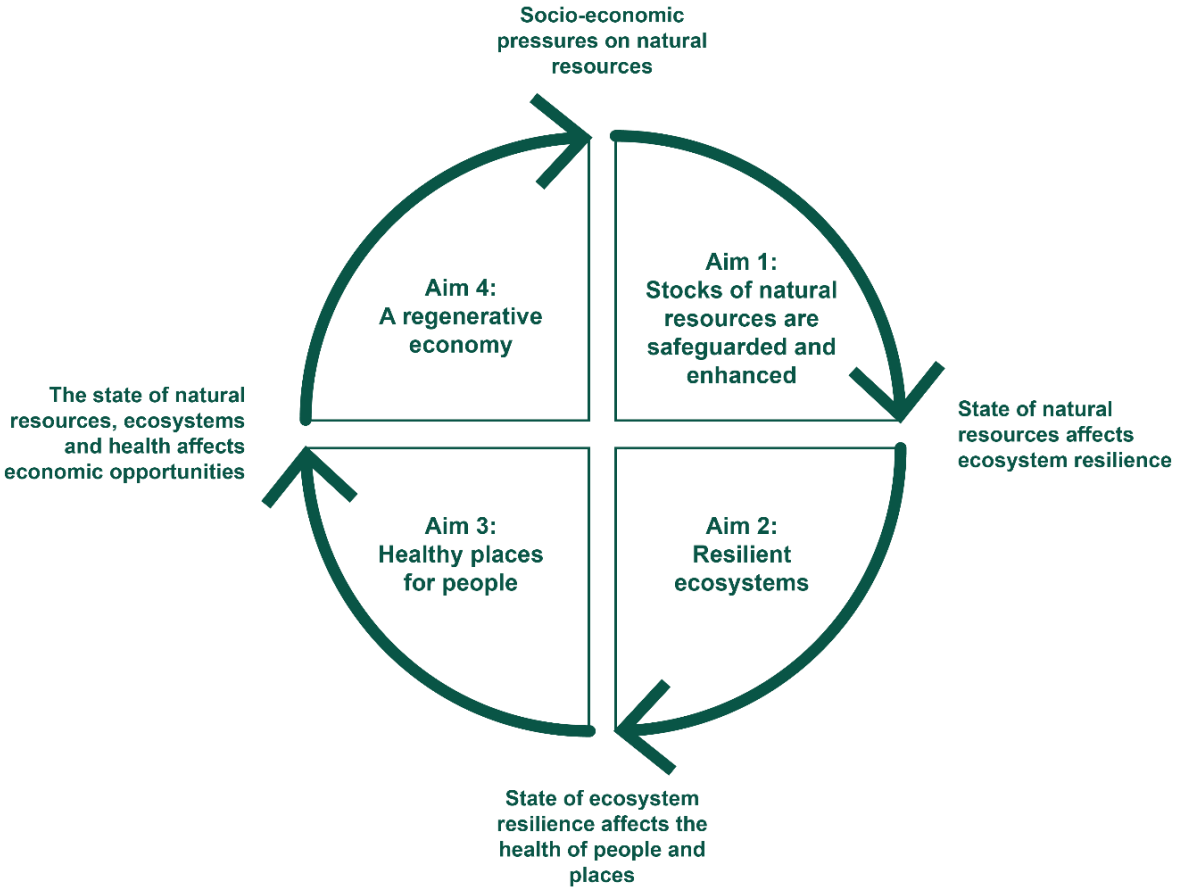
Since the publication of the first SoNaRR the four long-term aims of SMNR have been agreed which guide the assessments that underpin SoNaRR2020. The four aims of SMNR are:

- 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've 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 and 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 such as the Upper Conwy Catchment Project aims 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.

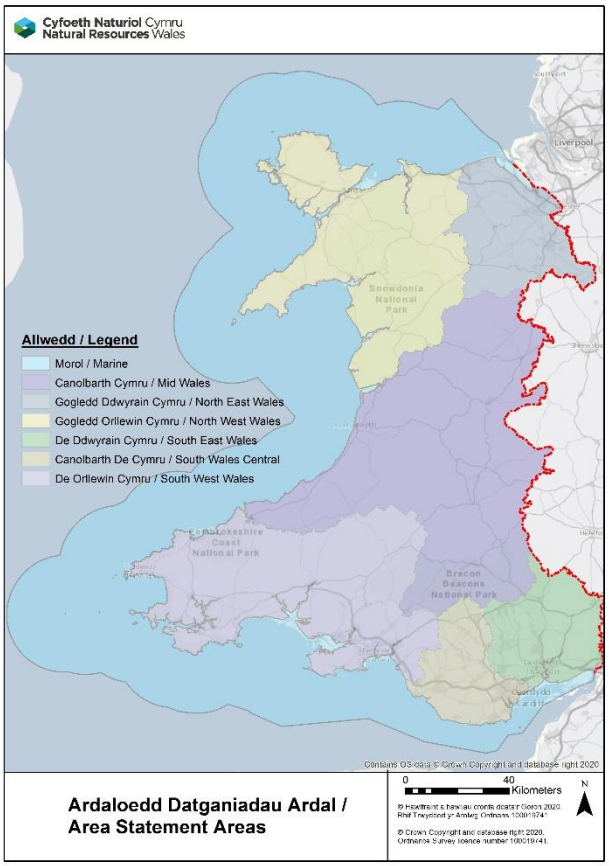
The Environment (Wales) Act 2016 introduced nine principles to help provide a method and a guide for considering SMNR, which are shown in Figure 4 below. The principles of SMNR are how we embed the four aims of SMNR. Involvement of partners and stakeholders in the Area Statements process is an important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

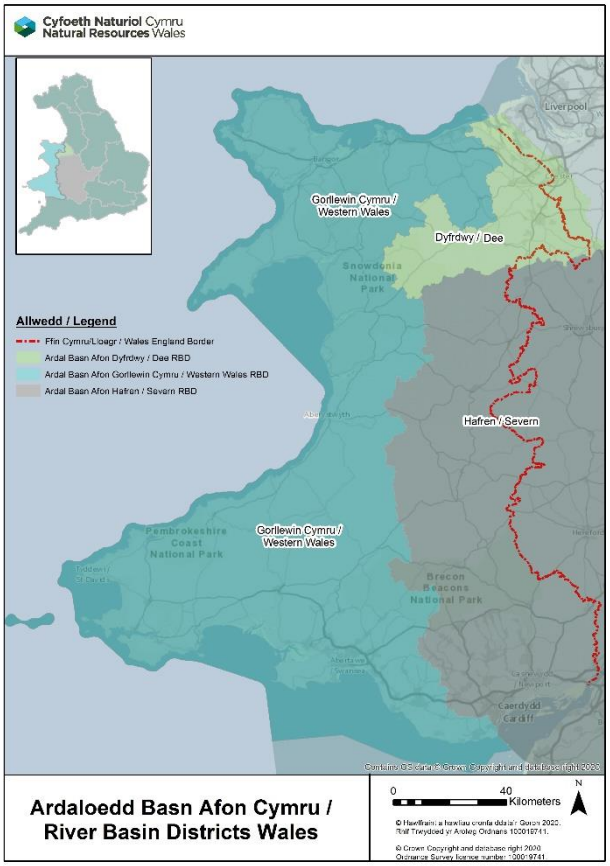
Figure 4 Nine principles of SMNR

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 Western Wales RBD includes part of the North East Area Statement, North West Area Statement, Mid Wales Area Statement, South West Wales Area Statement, South Central 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 Evidence Needs

NRW is an evidence informed organisation with its evidence activities defined as:

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

NRW has developed 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.

2. The Western Wales 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 that is risk based. This classification and information on the pressures and risks to waters is the basis for planning each cycle.

In 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 in Wales, 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. Classification 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, canal, 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, it is now updated once every 3 years for surface waters. The most up to date classification is the 2021 classification and this is available on Water Watch Wales. The number and type of water bodies are shown in Table 2 below setting the baseline for the third cycle. Note the river category also includes canals.

Table 2 Number and types of water bodies in the baseline third cycle RBMP (2021-27)

Number of water bodies	Natural	Artificial	Heavily Modified	Total
River	378	3	48	429
Lake	24	2	35	61
Coastal	18	0	5	23
Estuarine	18	0	10	28
Groundwater	25	0	0	25

Number of water bodies	Natural	Artificial	Heavily Modified	Total
Total	**463**	**4**	**99**	**566**

Note the river category also includes 3 canal water bodies

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 across Wales. 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
- Neath and Tennant canal has been split into two water bodies for the third cycle.

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 **Planning Overview Annex (Wales).**

2.1.2. Surface waters – status

For rivers (canals), 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 541 surface water bodies in the Western Wales RBD, including designated A/HMWBs and all water body types: river (including 3 canal water bodies), lake, coastal and estuarine waters. Table 3 and Table 4 below shows the number of water bodies in each status class using the most recent (2021) ecological and chemical classification data.

Table 3 Most recent (2021) ecological classification for surface waters (assessed water bodies)

No. of water bodies	Bad	Poor	Moderate	Good	High
River	2	31	194	202	0
Lake	1	15	31	13	1
Coastal	0	1	11	10	1
Estuarine	0	1	20	7	0
Total	**3**	**48**	**256**	**232**	**2**

Table 4 Most recent (2021) chemical classification for surface waters (assessed water bodies)

No. of water bodies	Fail	Good
River	27	402
Lake	1	60
Coastal	9	14
Estuarine	8	20
Total	**45**	**496**

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 25 groundwater bodies in the Western Wales RBD all achieve good quantitative status and 13 achieve good chemical status. The 2021 classification has identified 4 groundwater bodies 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 (2021) classification of quantitative classification for groundwater

No. of water bodies	Poor	Good
25	0	25

Table 6 Most recent (2021) classification of chemical classification for groundwater

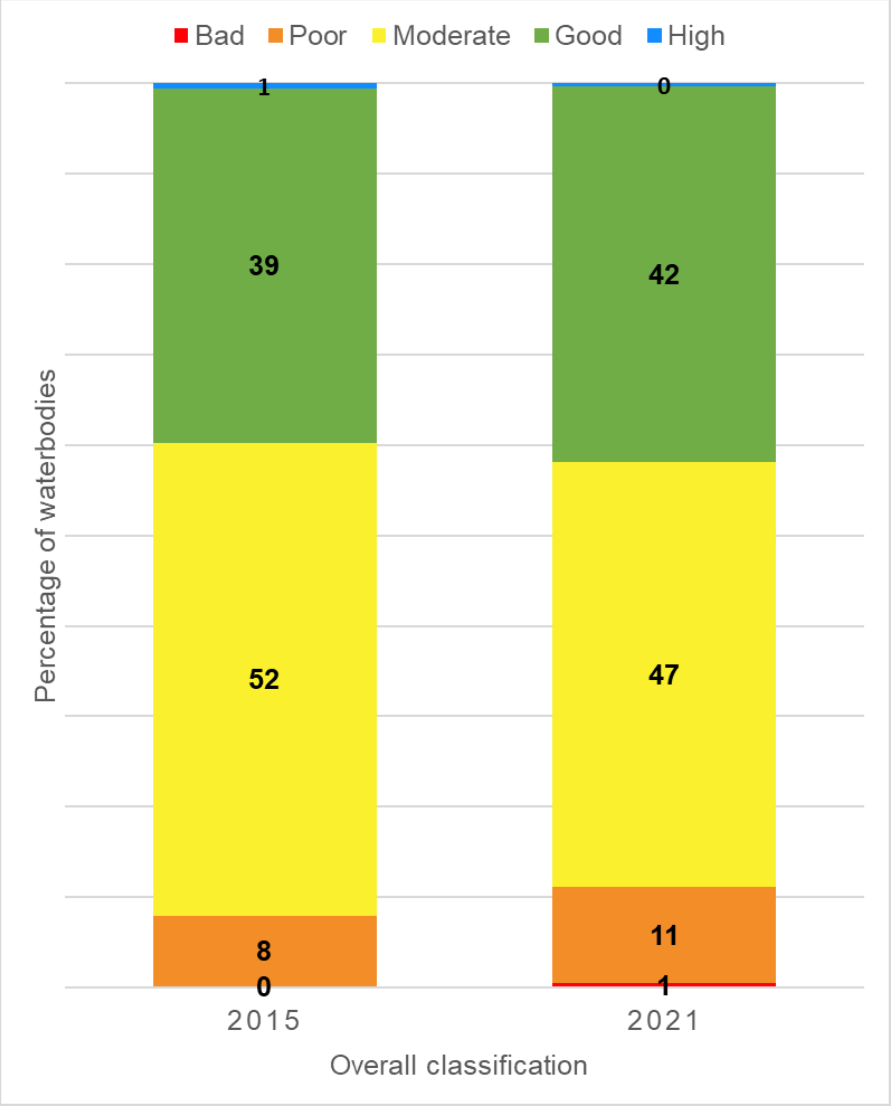
No. of water bodies	Poor	Good
25	12	13

2.1.4 Changes to classification since 2015

2.1.4.1 Overall status

In 2015, 40% of water bodies in the Western Wales RBD achieved good or better overall status. We predicted that this would rise to 44% by 2021. The most recent classification results indicate that 42% of water bodies achieved good or better overall status (Figure 6). 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 the time of classification.

Figure 6 Comparison of the overall baseline classification in 2015 with the most recent classification in 2021

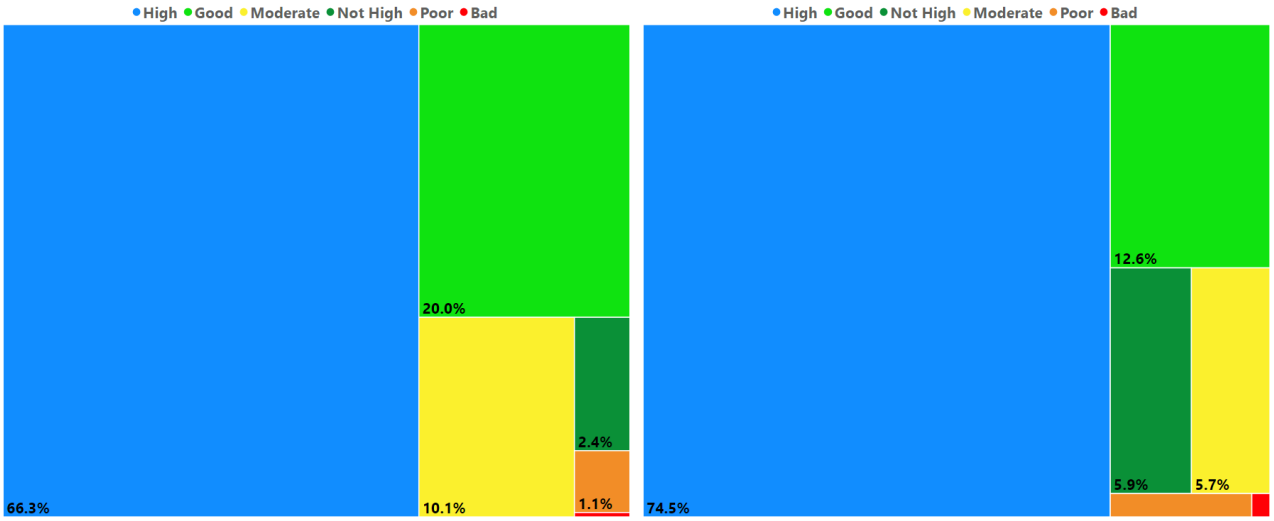


2.1.4.2 Element level status

For each water body the overall water body classification is made up from several 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 (Figure 7) that gives a better holistic view of environmental status. In the Western Wales RBD 93% of elements individually are at good or better status in 2021 compared to 88% in 2015. Figure 7 below represent a summary of the element level data for each of the five classes using the most up to date information for 2021 compared to 2015. The area of each category in the charts below is proportional to the result of each class.

Figure 7 Western Wales element level 2015 (left) and 2021 (right)



Looking at the data for the different types of water bodies in the Western Wales RBD, in 2021 for rivers (not including canals) 94% of elements are at good or better status, for lakes 89%, for transitional waters 88%, coastal waters 92%, canals 69% and groundwater 93%. The overall view of status at an element level is positive and demonstrates the effort that NRW 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, mitigation measures assessment and fish. In lakes, total phosphorus, macrophytes and mitigation measures assessment are elements that have a significant proportion at less than good status. In transitional and coastal waters mitigation measures assessment and dissolved inorganic nitrogen are the primary elements causing water bodies to be at less that good status. Nutrients and mitigation measures in HMWBs 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

A comparison between the start and end of the second cycle classifications using the same standards and water body network shows that 106 elements in 63 surface water bodies and 1 groundwater body require further investigation to understand the causes of a deterioration in status e.g. from good to moderate. 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.

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 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

NRW manage chemicals 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 improves 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 uPBT 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, 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.

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 Western Wales 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 (Section 3.1.2 **Planning Overview Annex (Wales)**). 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 Tables 7 to 11 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)** for further details and links to sources of compliance data for different types of Protected Areas.

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 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. One Shellfish Water in Western Wales RBD meets this objective.

Table 7 Drinking water protected areas (DrWPA)

Water body type	**Number**	**Number at risk**
Surface water	53	22
Groundwater	25	4

Table 8 Shellfish Water protected areas

Water body type	**Total Number**	**Meeting objective**
Shellfish Waters	14	1

Table 9 Bathing Water protected areas

Bathing water	**Number**	**% Compliant**
Bathing Water	105	100

Table 10 Nutrient Sensitive area protected areas

Nutrient Sensitive area protected areas	**Number**	**Length (km)/Area (km^2) designated**
Eutrophication in rivers	1	8.7km
Eutrophication in estuaries or coastal waters	2	9,730km^2

Table 11 European site protected areas

European site protected area	**Number**
Water dependent SACs	66
Water dependent SPAs	21
Ramsar sites	7

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

In Wales the condition of designated habitats and species features in SACs and SPAs are reported separately over six-year cycles. 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, Compliance Assessment of Welsh River SACs against Phosphorous Targets. The evidence review shows that overall, phosphorus breaches in the Afonydd Cleddau and lower Afon Teifi SACs against the revised tightened targets set. However, the Afon Gwyrfai, Afon Glaslyn (Meirionnydd Oakwoods), Afon Eden and Afon Tywi passed the targets. Further information is available in Section 3.2.4.1

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

No changes to the nutrient sensitive areas have been made under the Urban Wastewater Treatment (England and Wales) Regulations 1994 for Eutrophication in rivers.

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.

2.3.1.1 Drinking water (surface water and groundwater)

We have reviewed all of the surface water DrWPA’s. A number of DrWPA’s have been removed from the Protected Area Register for the Western Wales RBD (listed in Table B2 in Appendix B **Planning Overview Annex (Wales)**).

2.3.1.2 Shellfish Waters

Shellfish Water Protected Areas have been reviewed and proposed changes were consulted on by Welsh Government in 2021. As a result, seven Shellfish Waters have been de-notified and one new Shellfish Water in the Lower Cleddau has been notified.

2.3.1.3 Bathing Waters

Three new Bathing Waters have been designated in Western Wales RBD since 2015 Aberdyfi Rural, Colwyn Bay Porth Eirias and Glan Don Beach.

2.3.1.4 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.

A review of the water dependent SAC features associated with the European sites listed on the register found that one SAC should be removed off the register as it did not qualify as a water dependent site, Coed Cwm Einion (UK0030117).

There have been some changes to the SPAs in Wales. 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. In 2017, the Anglesey Terns / Morwenoliaid Ynys Môn SPA (UK9013061) was renamed and extended. The Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro SPA (UK9014051) was renamed and extended in 2016 and a new SPA was also designated for red-throated diver, Northern Cardigan Bay / Gogledd Bae Ceredigion SPA (UK9020327).

Three new large Harbour porpoise SACs were designated in 2019, West Wales Marine / Gorllewin Cymru Forol SAC (UK0030397), Bristol Channel Approaches / Dynesfeydd Môr Hafren (UK0030396) and North Anglesey Marine / Gogledd Môn Forol (UK0030398). These changes have considerably increased the area of European sites in Wales.

The Protected Areas Register for Wales has been updated and is 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, canals, 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

All measures and many of the day-to-day activities of NRW and many of our partners contribute to preventing deterioration of the water environment. Through our collective knowledge, we are able to identify which water bodies are specifically at risk and set out the measures, where possible, to prevent or mitigate those risks. For example, the NRW 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 (HEP) 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 included the Water Industry Investment Programme and local measures for the targeted water bodies. For further detail of the 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 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 Waste water Treatment Works (WwTW)

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

In Western Wales RBD specifically, DCWW delivered:

- 8 schemes at WwTW to meet WFD Regulations 2017 no deterioration requirements
- 3 schemes at WwTW to contribute to delivering WFD Regulations 2017 good ecological status
- A major Rainscape programme at Llanelli and Gowerton reducing the impact of their assets on Burry Inlet, and further coastal schemes benefiting Swansea Bay and Conwy Estuary

A further 8 schemes contributing to good ecological status were planned for delivery by DCWW.

2.4.2.1 Target water bodies

To focus on improving water body status in the second cycle a number of water bodies in the Western Wales RBD were targeted for the implementation of local measures. NRW prioritised improving compliance with good overall status in 21 water bodies that were at moderate/poor status and improve 4 water bodies that were at poor status to moderate. To do this a total of 37 local measures were identified for the 25 target water bodies to address diffuse and point source pollution, control or manage abstraction and to improve modified habitat. We predicted that these measures (in target water bodies) would contribute to an increase in all water bodies meeting good or better overall status by 2021 from 40% in 2015 to 44% in 2021. The analysis above (section 2.1.4.1) shows that in 2021, 42% achieved good or better overall status which is below what we predicted in the second cycle (2015).

Of the water bodies that were targeted we have observed some improvement in element level classification in 17 of water bodies. Reasons for this are complex. Many of the measures that were put in place with the aim of achieving good status/potential by 2021 may not be realised in the classification until the water quality and ecology has had time to recover, be monitored and classified.

2.4.2.2 Investigations

Since the 2015 plans were published, NRW has carried out a programme of investigations in the Western Wales 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.

2.4.2.3 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 were 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

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 2 years. Projects included producing guidance on management of septic tanks 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.

Welsh Government Capital funding

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.

The Cleddau and Milford Haven capital funded project has been working with others to tackle issues such as invasive species, habitat fragmentation and nutrient enrichment which threaten important and protected wildlife and habitats.

Physical modification project work is ongoing in the River Clywedog – Gwenfro to Black Brook to look at the feasibility of renaturalisation options including reconnection, wetland restoration, floodplain lowering and increasing channel sinuosity. Work includes options for mitigating against barriers to fish migration to pursue fish passage mitigation for all species with a full range of natural riverine processes reinstated.

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.

2.5 Challenges in the Western Wales RBD

The Welsh Government declared a 'Climate Emergency' in Wales in April 2019 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).**

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

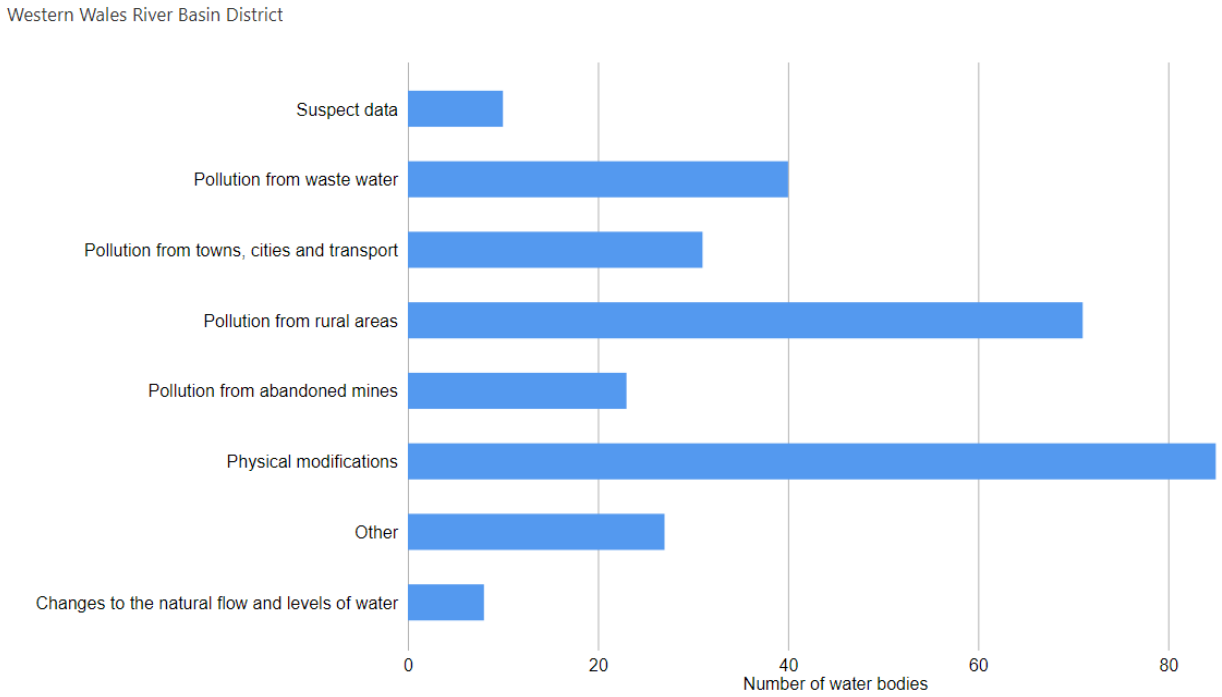
- **Changes to the natural flow and levels of water**. Taking too much water from rivers lakes and underground causes problems for wildlife and reduces the water available for people to use

- **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 has carried out several investigations in the Western Wales 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 Western Wales RBD. This 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 flows 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

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 12 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 12 List of available risk assessments per pressure type and water category

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

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 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)**. 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 this document, 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 DrWPA's, 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. 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.

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)**, 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
- Protected Areas including the SAC Rivers Project
- Flood and coastal risk management
- Water Industry Investment Programme including the storm overflow roadmap
- Water resources sustainability measures
- Sustainable land management - agriculture
- Sustainable land management - woodland and forestry
- Welsh Governments Capital fund
- Opportunity Catchments

We will take a catchment to coast 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

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 aim 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.

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 can be found in the core management plans and the Regulation 37 marine equivalent.

The Habitats Regulations Assessment (HRA), published alongside the plan, assesses the 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 SAC Rivers Project

In January 2021 NRW published an evidence report titled Compliance Assessment of Welsh River SACs against Phosphorous Targets. This includes the Afon Teifi and Afonydd Cleddau SACs. The evidence review shows that overall, phosphorus breaches are widespread within the river SACs against the revised tightened targets. 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, DCWW and the National Park Authorities. 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 targets and 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.

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 Western Wales, for the third cycle DCWW aim to deliver:

- Schemes to meet European site protected area objectives
- Schemes to meet WFD Regulations 2017 no deterioration requirements
- Schemes to contribute to delivering WFD Regulations 2017 good ecological status

- Investigation and targeted improvements to reduce the impacts of assets on fish passage
- SMNR pilot catchments where DCWW will look to explore innovative approaches to addressing the impacts of their assets in the Afan, Teifi and Clwyd catchments
- Improvement schemes to meet Urban Waste Water Treatment (England and Wales) Regulations 1994 flow requirements
- Improvements to CSOs to meet Shellfish Water requirements at Menai East

NRW and DCWW are currently working on developing the 2025-2030 business plan (AMP8), this will include delivery of three Opportunity Catchment local actions. These will require funding through the sector's Periodic Review process. Specifically, such actions will need to be included in the AMP8 (2025-30) National Environmental programme (NEP) by NRW. The local actions are the Drinking Water Protected Area safeguard zones (Anglesey) and the SMNR pilot areas within the Clwyd and Swansea Bay Opportunity Catchments.

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.

3.2.6.1 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. NRW maintains 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. 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. Between 1 January 2017 and 31 December 2019 NRW offered a simpler transitional application process for previously exempt abstractors. NRW must determine all transitional applications by 31 December 2022. Some abstractions and impoundments that are considered low risk remain exempt.

NRW is 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 - A Summary for Wales 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 Summary for Wales 2017 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.

3.2.9 Sustainable land management - Woodland and forestry

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 priority 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 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 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 NRWs 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

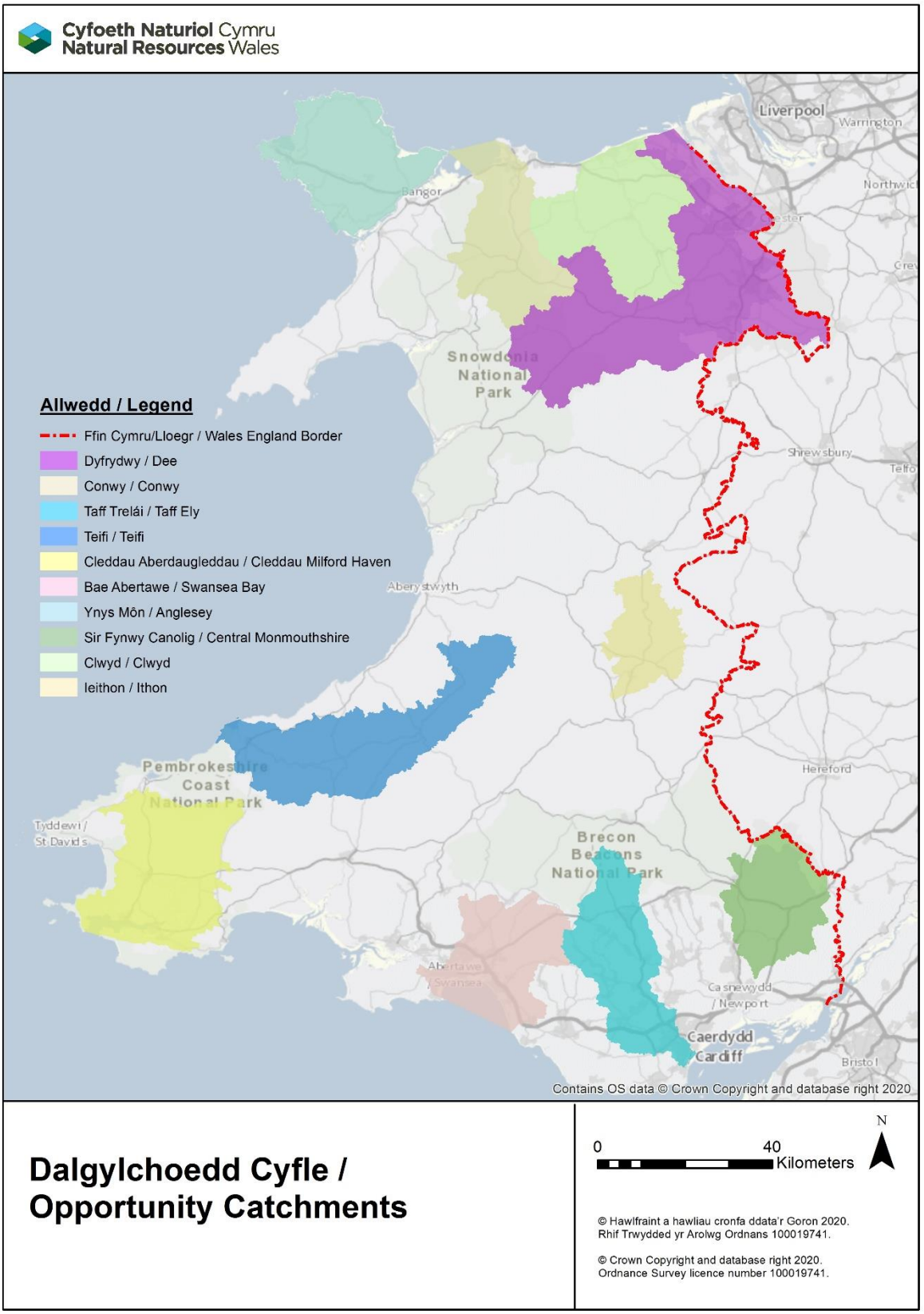


Table 13 Percentage of water bodies in each Opportunity Catchment meeting good overall status by water body type (2021 classification data)

Opportunity Catchment name	River, Canal, Surface water transfer	Lake	Coastal	Transitional	Groundwater	All
Ynys Môn	30	20	0	0	50	26
Conwy	47	0	0	0	0	31
Clwyd	40	0	n/a	0	100	43
Swansea Bay	32	33	0	0	0	25
Cleddau/ Milford Haven	17	0	0	0	50	17
Teifi	43	0	n/a	0	0	37

Nutrients, chemicals and physical pressures at the coast are the most significant pressures that result in failure to achieve good status/potential 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 RBMPs which contribute to progress towards the 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 Catchments in the Western Wales RBD

There are six Opportunity Catchments in the Western Wales RBD which are, Cleddau & Milford Haven, Conwy, Swansea Bay, Teifi, Anglesey and Clwyd.

Summary of the Cleddau & Milford Haven Opportunity Catchment

The Cleddau and Milford Haven Opportunity Catchment includes a diverse landscape of rivers, estuary and coastal areas comprising of the Eastern and Western Cleddau rivers, the Daugleddau estuary and the Milford Haven waterway. The Afonydd Cleddau SAC, the

Pembrokeshire Marine SAC and part of the Pembrokeshire Coast National Park (PCNP) reflect the areas high landscape and conservation value of the area. The catchment supports major public water supply abstractions, commercial sea fish and shellfisheries and numerous recreational activities. The catchment is characterised by dairy farming, sheep rearing and potato growing. The priority issues for water quality are addressing nitrate, phosphorus and sediment pollution from point and diffuse sources, physical modifications to river channels and banks (including historic channel realignment, in-channel structures, floodplain disconnection, barriers to fish passage and the removal/disruption of natural habitats), grazing, trampling and cultivation to bank edge (loss of riverine wildlife corridor) and the widespread presence of invasive species.

Haverfordwest is the largest town in the catchment with historic flooding problems due to the Western Cleddau flowing through the town centre to its tidal limit. Agriculture is the dominant land use with sustainable land management hugely important for farmers, the environment and the local economy. Agriculture and tourism are vital to local communities and the economy, the latter relying upon high-quality natural resources and an unspoilt landscape.

Catchment partnership work ranges from working with the Pembrokeshire Marine SAC Relevant Authorities Group to improve the condition of the marine SAC to working with PCNP Authority to graze upland commons for habitat and biodiversity benefit. At sites throughout the catchment, work with the West Wales Rivers Trust and Dŵr Cymru is improving water quality, safeguarding drinking water sources, aiding fish passage, improving habitat and species' resilience and providing health and well-being opportunities.

Working with the agricultural industry and learning from partnership projects such as the Building Resilience in Catchments (BRICs) and the Ecosystems Enterprise Partnership – Building Natural Solutions project, will enable further exploration and implementation of more innovative catchment solutions. This will lead to more resilient farms, high quality natural resources and sustainable economic development, benefitting both communities and businesses. The 4 Rivers for LIFE and the Reconnecting the Salmon Rivers of Wales - Swansea University projects in the Cleddau catchment will enable significant work to be undertaken to improve the health of the river, its fish population by removing barriers to fish migration, wildlife, water quality and restore natural river geomorphology.

Nutrient impacts from wastewater, industrial discharges and agricultural land enter the Milford Haven waterway from the catchment area and impacts upon the water body status. Further collaborative work is needed to pursue improvements that will reduce nutrient pollution and improve the condition of the marine SAC features. By doing this we will help wildlife, people and local businesses increase their resilience to climate change.

The principal themes for the Cleddau & Milford Haven Opportunity Catchment aligns with the priorities identified within both the Marine and South West Area Statements and in particular the South West Area Statement themes of 'Ensuring Sustainable Land Management' and 'Reversing the decline in Biodiversity'.

We wish to work with the agricultural community to improve land management practises to reduce soil run-off, erosion and improve water quality. By working with others at a catchment scale we can tackle issues such as nutrient enrichment, invasive species and habitat fragmentation which threaten important and protected wildlife and habitats.

As part of a whole catchment source to sea approach other identified opportunities within the catchment include restoring natural hydromorphological forms and processes to rivers, managing access to water and implementing nature-based solutions.

Summary of the Conwy Opportunity Catchment

The Afon Conwy travels across the landscape connecting people and nature, from the source of water on the Migneint- Arenig-Dduallt SAC/SPA and the uplands of the Carneddau (part of the Eryri Site of Special Scientific Interest SSSI and SAC) and Mynydd Hiraethog SSSI, incorporating water dependent blanket bog through the estuary to the Menai Strait and Conwy Bay SAC. The NRW managed Gwydir Forest accounts for a large area of the catchment. Pressures within the catchment include habitat degradation (in particular of upland habitats such as blanket bog and peatland), flood risks from the rivers, sea and surface water, discharges from metal mines, point source and diffuse pollution from agriculture and water industry, physical modifications and acidification.

There is a history of flooding within lower lying communities in the valley and a major flood alleviation scheme constructed in Llanrwst in 2010, including formal and informal flood defences. There are a number of flood warning areas and a significant number of communities at risk of flooding. There are 4 or 5 coastal change areas within Conwy catchment affected by potential changes to the Shoreline Management Plan 2 (SMP2) policy by 2105.

The catchment already benefits from learning via partnership projects, such as the Upper Conwy Catchment and Dyffryn Dyfodol (Future of our Valley) projects. These partner-led collaborative and complementary projects work with communities, partners, tenants, landowners and residents to both improve land and water management and to work with others to imagine the best future for the people and wildlife of the area.

Opportunities for connecting people with nature extend beyond the Upper Conwy for example more widely across the Eryri/Snowdonia National Park, the Gwydir Forest and in tidal and coastal parts of the catchment, such as outdoor recreation, cultural and adventure tourism initiatives. There is a growing sustainable economy of businesses benefiting nature.

Opportunities are identified in the North West Wales Area Statement that align with the Conwy Opportunity Catchment priority issues and include river restoration, access to water, nature-based solutions and catchment management. The Marine Area Statement also highlights actions to improve the quality of estuarine and coastal waters within Opportunity Catchments.

Summary of the Swansea Bay Opportunity Catchment

The Swansea Bay Opportunity catchment encompasses the Rivers Tawe, Neath (lower rivers) and Afan as well as the Clyne and Kenfig catchments and the coastal area within Swansea Bay. This catchment has a fascinating landscape with a vibrant history ranging from the wild uplands of the Brecon Beacons to the heart of Swansea. Both recent and historic development has taken place in the valley bottoms adjacent to major watercourses. The uplands offer a high conservation value with numerous designated sites including SACs, SSSIs and the Brecon Beacons National Park. Agricultural activity in the uplands is largely restricted to sheep and beef farming with lower laying areas supporting dairy, beef and arable farming.

Following the demise of manufacturing, tourism has become increasingly important to the local economy and the area provides a diverse offering of recreational activities and attractions. The catchment area includes two designated bathing waters - Swansea Bay and Aberafan.

The Swansea Bay Opportunity Catchment features highly modified rivers with altered hydromorphology and disrupted natural processes. This makes catchments less resilient and limits the ecological recovery of river ecosystems. It results in loss of biodiversity, compromises the ecosystem services we rely upon, making communities and the environment more susceptible to the impacts of flood, drought, erosion and poor water quality.

Biodiversity in central urban areas of Swansea, Neath and Port Talbot is generally poor, there is scant amenity space and ecosystem connectivity is fractured. Air quality is not good and urban runoff can be polluted. Many of the river catchments are being degraded by Invasive Non-Native Species. Resource is needed to tackle this starting at the top of catchments assisted by community engagement.

Pollution from urban and rural areas and historic mining activities is adversely impacting on river water quality in the Opportunity Catchment area. Data supplied by Dŵr Cymru/Welsh Water is highlighting deficiencies in the sewer network, particularly in the Afan area. Tackling this will be a priority area of work.

There is high demand at times for competing types of recreational access to both our freshwater and marine environments and improving water quality will be essential to meet this demand and capitalise on the wider well-being benefits that our water environments offer.

Water bodies are impacted by physical modifications, sewage and wastewater treatment work discharges, pollution from urban and rural areas and mines. The Swansea Central Area: Regenerating our City for Wellbeing and Wildlife - Swansea green infrastructure strategy is designed to bring more nature into the Swansea Central Area with high quality multifunctional green infrastructure.

Swansea Environmental Forum projects such as Clear Streams can be developed to promote a heathier and cleaner aquatic environment.

The priorities within the Swansea Bay Opportunity Catchment align with the South West Wales Area Statement themes, in particular ‘Ensuring Sustainable Land Management’ and ‘Reversing the Decline in Biodiversity’ and ‘Reducing Health Inequalities’ themes. By building on the existing momentum of local partnerships there are opportunities to improve water quality for wildlife and people, develop natural flood risk management approaches and improve access to a healthier environment. The Marine Area Statement also highlights actions to improve the quality of estuarine and coastal waters.

Summary of the Teifi Opportunity Catchment

The Afon Teifi has been identified as an Opportunity Catchment due to its diverse landscape with varied river catchments descending through rocky valleys down to low lying pasture. Agriculture and forestry account for the majority of land usage and there is a legacy of historic metal mining. Due to its important biological features the Afon Teifi and ten of its tributaries are a SAC and SSSI. The presence of the beautiful landscape and

diverse wildlife enhance the socio-economic and cultural value of the area by providing a high-quality environment for people to live in. Dairy farming predominates in the lower catchment with the uplands favouring sheep farming and forestry. Starting wholly in the county of Ceredigion, downstream the Afon Teifi forms the border between Ceredigion and the counties of Carmarthenshire and Pembrokeshire; the catchment includes tributaries within these areas. The Teifi also flows through the Cors Caron SAC and National Nature Reserve and flows out into the Cardigan Bay SAC.

Priority issues for water within the Opportunity Catchment include acidification, impact from historic metal mining, diffuse rural pollution from agriculture and forestry, point source pollution from sewage discharges from wastewater treatment works, intermittent assets and areas away from mains sewerage areas, physical modification and INNS. Also, priorities include communities at risk of flooding, abstraction demands due to increasing water usage, climate change pressures and taking an integrated approach to riverine and coastal flood risk management.

The Teifi supports an important salmon and sea trout fishery which is at risk for a variety of reasons, including water pollution caused by land management issues. There are strategically important public drinking water abstractions at Strata Florida and Llechryd. The principal theme for the Afon Teifi Opportunity Catchment is to work collaboratively with others to improve the management of land and water quality. The 4 Rivers for LIFE project aims to improve the conservation of four SAC rivers in Wales including the River Teifi by rehabilitating and restoring their natural processes, features and physical habitats.

Pursuing sustainable management will mitigate the pressures which include historic metal mining, rural land management, artificial barriers and acidification that are impacting the rivers WFD Regulations and Protected Area status and its internationally important biodiversity. Taking an integrated catchment approach will contribute to the wider SMNR outcomes at a landscape scale and benefit all fish stocks. Partners are already working in the catchment and there is an opportunity to combine work on ecosystem resilience, metal mines, agricultural pollution, land management, river restoration and Natural Flood Management to benefit the ecology and people of the Teifi Valley.

Priorities within the Opportunity Catchment align with those identified in the Mid Wales Area Statement and South West Wales Area Statement such as river restoration, access to water, nature-based solutions and catchment management. The Marine Area Statement also highlights actions to improve the quality of estuarine and coastal waters.

Summary of the Anglesey Opportunity Catchment

Anglesey has a rich and diverse water environment which includes its rivers, lakes, groundwater, estuaries, coastline and beaches. There are many important water dependent habitats, species and landscapes on Anglesey including SSSIs, SACs, National Nature Reserves (NNRs), SPAs and the Area of Outstanding Natural Beauty (AONB), which rely on good water quality and quantity to flourish. However, the water quality is under pressure from impacts such as from rural diffuse pollution, discharges from sewage and wastewater sources, physical modification and historic metal mining. Some traditional sheep farms have converted to dairy farming: a growing sector on the island, presenting different land management pressures. Watercourses are typically low gradient and slow flowing, with fewer flushing flows, and this gives rise to issues linked to siltation and dredging.

The principal theme for the Anglesey Opportunity Catchment is to develop a network of resilient ecosystems across the Island and connect people with their local environment. By creating a landscape where wildlife can thrive within a clean, healthy and sustainable environment, resilience to changes in climate can be developed. Through building in community involvement into the work within this Opportunity Catchment, it will develop a sense of place, ownership and appreciation for the local environment. There is a future ambition for the development of central Anglesey green and blue infrastructure to link people with place and create a wildlife corridor to connect habitats.

The Anglesey Fens SAC is the second largest calcareous fenland in the UK but is currently in unfavourable condition and remains fragmented across the island. Measures put in place via partnership projects, such as through the Anglesey and Llŷn Fens LIFE project, help to reduce and remove pollutants which then benefits these habitats and contributes to delivering WFD Regulations objectives.

The entire Anglesey coastline falls within North West Wales SMP2 and a significant number (17) of coastal management change areas. Communities affected by most recent flooding include Llangefni and Dwyran, with several other communities at risk from flooding.

The priorities for water within the Anglesey Opportunity Catchment are the improvement of wetlands and the wider connectivity of terrestrial ecosystems, restoration of river habitats, protection of lake water bodies including those which are SSSIs, ensuring the quality of estuarine and coastal waters to support shellfisheries and bathing waters, management of INNS and protecting species. Priorities also include improving communication and understanding of flood risk, enabling communities to build resilience to flood risk, integrating catchment-based approach to flood risk management measures and improving riparian woodland. Tackling pressures from historic metal mining, nutrient enrichment of freshwater, estuarine and coastal water bodies will help protect drinking water, wildlife and other water users. Through working with Public Service Boards and the Climate Change subgroup, the wider benefits of the Opportunity Catchment work on Anglesey can be maximised.

The Opportunity Catchment priorities also with those identified in the North West Wales Area Statement such as river restoration, access to water, nature-based solutions and catchment management. The Marine Area Statement also highlights actions to improve the quality of estuarine and coastal waters within the Opportunity Catchment.

Summary of the Clwyd Opportunity Catchment

The Clwyd Opportunity Catchment area covers three unitary authorities - Conwy, Denbighshire and Flintshire. The River Clwyd has its headwaters in Clocaenog Forest, while its main tributary, the Elwy rises to the west on the Denbigh Moors. The catchment covers an area of 821.5 km^2, including a coastal strip length of 31.1km with three designated bathing water beaches. In terms of SMP2 and the Marine Area Statement the Clwyd Estuary will be subject to coastal adaptation or managed realignment by 2055.

Agriculture dominates the largely rural Clwyd catchment. Part of the lower catchment was previously designated as a nitrate vulnerable zone for both surface and groundwater before the Control of Agricultural Pollution Regulations were introduced in 2021.

Through working in partnerships and with communities, we can continue to pursue integrated catchment management within the Clwyd Opportunity Catchment in alignment with the North East, North West and Marine Area Statement themes delivering against WFD and flood risk priorities and adaptation and mitigation in response to the climate emergency. Working with partners enables us to improve our understanding of flood risk and awareness and increase resilience to flood events and enable existing communities to become more resilient. The Clwyd catchment has several communities at risk of flooding with Rhyl in 2019 being ranked third and Prestatyn ranked eighth in Wales' communities at risk register due to the combined risks of flooding (not including the impacts of climate change).

Pressures in the catchment include diffuse urban and rural pollution impacting on river, estuary and coastal (including bathing water status) water quality. Maintaining bathing water quality will support the local economy and deliver significant physical and mental health benefits for the community and visitors specifically for deprived communities in Rhyl. Other issues include physical modifications impacting on hydromorphology and fish migration, INNS, sewage discharges from wastewater treatment works, intermittent assets and areas not on mains sewerage and slurry management. Significant projects include the Lower Clwyd Project which contributes to the delivery of statutory objectives. Priority issues also include meeting abstraction demands in response to increasing water use and climate change pressures, improvements to the hydrometry and telemetry network on Clwyd and Elwy including the Nant Barrog. Work will continue with land management and forestry resource plans to mitigate and manage flood risk.

Taking a SMNR approach to catchment management in the Opportunity Catchment which benefits riverine, estuarine and marine water quality (including bathing waters) , communities at flood risk, fisheries, habitat restoration, wildlife and people aligns with those themes identified in the North East Wales and North West Wales Area Statements including river restoration, access to water, nature-based solutions and catchment management. The Marine Area Statement also highlights actions to improve the quality of estuarine and coastal waters.

3.4 Setting Objectives for the third cycle

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 2 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).

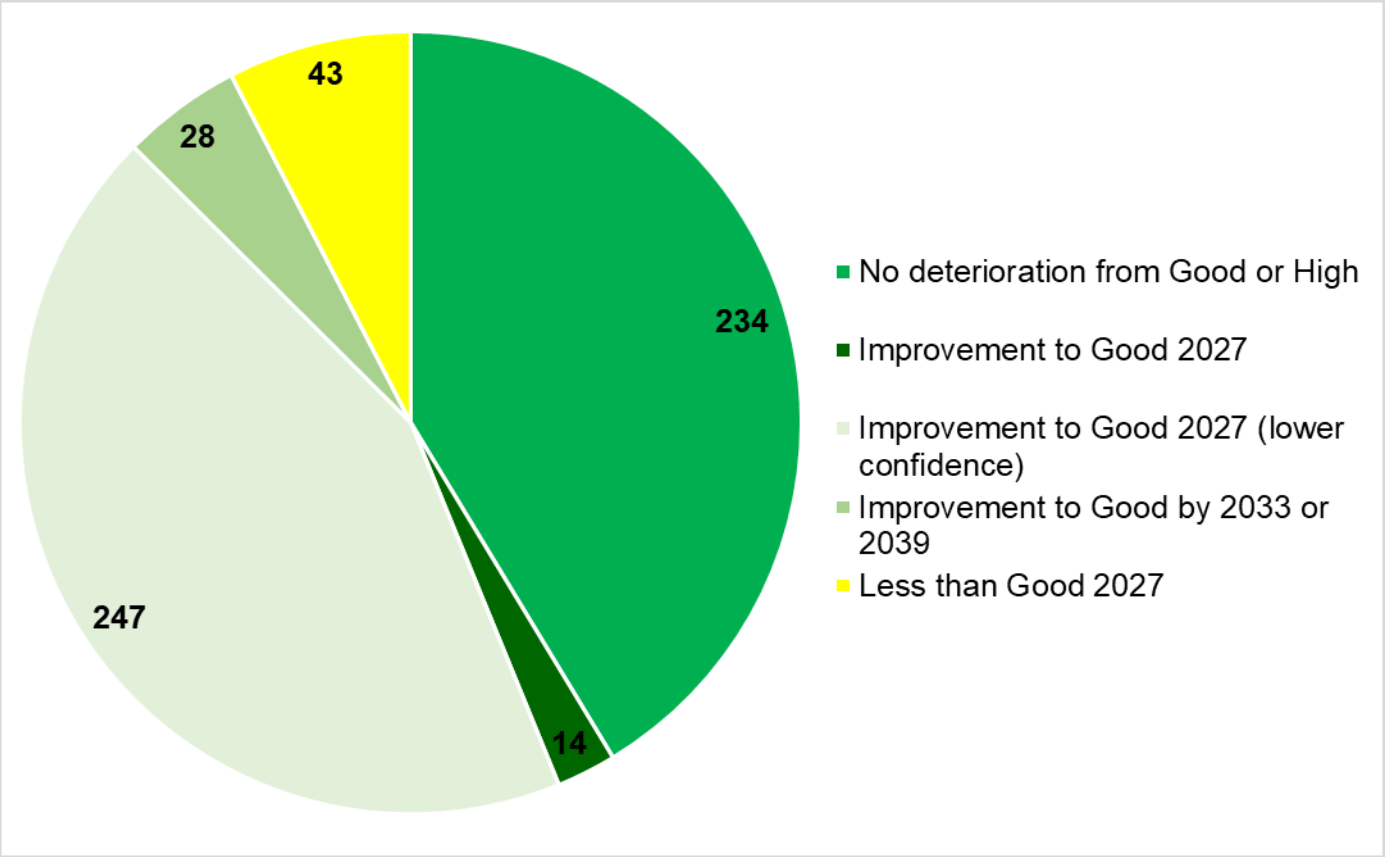
For each Protected Area, other than shellfish water protected areas, the objective is to achieve compliance with any standards/targets and objectives required by the relevant Regulations for which the area or body of water is protected. For European sites the objective is to achieve favourable condition. 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.

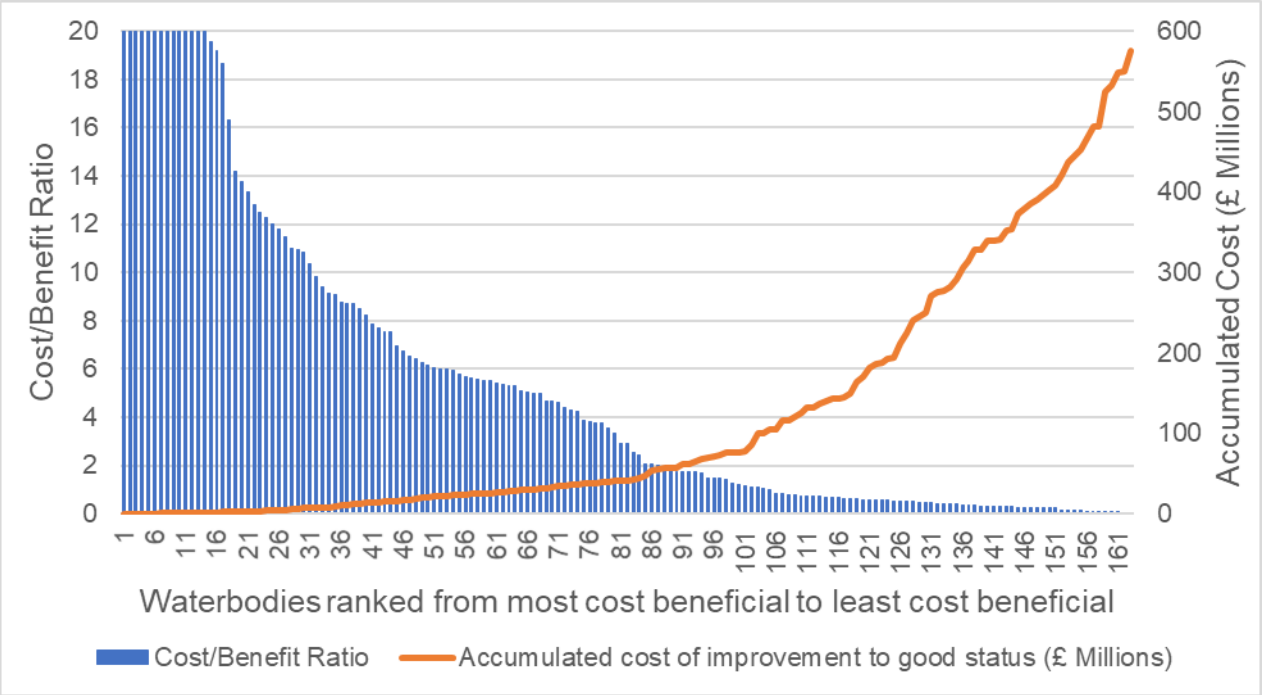
Figure 10 shows that of the 566 water bodies in Western Wales RBD, 234 are at good or better status and therefore have an objective of no deterioration over the third cycle. 14 water bodies are expected to improve to good status by 2027. 247 other water bodies are currently at less that good status and have an objective of good status, but it is believed that the reasons for not achieving good are yet to be confidently identified or the measures unlikely to be in place by 2027. This results in 495 water bodies (87%) having an objective of good status by 2027, however at present we are only confident that 248 will achieve or remain at good status or potential (44%). It is intended that the investigations programme will help provide more definitive objectives for these water bodies in the future. 28 water bodies have a delayed objective of good by 2033 or 2039 for reasons of acidification or for chemicals where the measures to achieve good have been taken but recovery will take longer than 2027. Finally, 43 water bodies have an objective of less than good status or potential on the basis of them being disproportionately costly, or technically infeasible to improve to good status over the third cycle. In all 43 water bodies some national and local measures will be taken to improve the water quality and contribute towards SMNR values. 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. No deterioration remains an objective for these 43 water bodies.

Figure 10 Proportion of water bodies and objective categories for Western Wales RBD



The disproportionate cost assessment has been made on 163 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 163 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 59 water bodies which have a cost benefit ratio of less than 1. Approximately half of these are associated with European site features and so retain an objective of good status. The overall cost of improving the water bodies for which we have costs for is £576 million. The actual cost of improving all water bodies is likely to be significantly larger, however the estimated cost to improve the 104 water bodies which are not disproportionately costly is £100 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 or potential



4. Implementation and where we want to be by 2027

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 Opportunity Catchments within the Western Wales RBD 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 outcomes of the water related LIFE projects in the RBD (listed in Appendix 1)
- Finalise mitigation measures assessments in some of the HMWBs

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.

4.1 Where do we want to be 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.

4.1.1 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 have been difficult to cost and it is hoped that an improved calculation will be made in the future. The total cost to improve fish passage and habitat and reduce the impact of physical modification in 19 water bodies which we have been able to generate costs for is £16 Million. However the cost throughout the RBD is likely to be much greater. In combination with the cost of remediating other pressures, 7 water bodies are considered to be disproportionately costly to improve however because 1 is associated with a water dependent European site it remains a priority and it maintains 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.
- We will provide more coastal habitat by managed realignment to compensate for the impact of coastal squeeze. Where ongoing defence is essential, we want to see increased use of nature-based solutions.
- 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.

4.1.2 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), subject to funding through the sector's Periodic Review process this will include delivery of local actions within the Opportunity Catchments.

- 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 75 water bodies back to good status results in a total cost of £296 million of which almost all is associated with upgrades to wastewater treatment discharges. In combination with other costs of improvement, 39 of these water bodies are calculated to be disproportionately costly to improve, however many are associated with European sites and so remain a priority and have an objective of Good status by 2027.

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 Teifi & Cleddau 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 Cleddau and Teifi SAC rivers 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. NEP) and the development of innovative solutions (e.g. SMNR pilot catchments)

4.1.3 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 85 water bodies that we have been able to cost has been calculated at £45 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 28 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. Many of the 28 water bodies deemed to be disproportionately costly to improve are also in protected areas and retain an objective of good status by 2027.

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 Teifi & Cleddau 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.

4.1.4 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:

The total cost of improving 33 water bodies which are failing due to metal mine discharges is estimated at £205M. 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. In combination with the resolution of other pressures, 21 of these water bodies have been calculated at being disproportionately costly to improve to good status, but because many of the water bodies are associated with European sites, they remain a priority to improve and retain an objective of good status by 2027. To put these costs 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 alone.

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.

4.1.5 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
- 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:

43 water bodies have been analysed for acidification. The total cost of improvement, primarily associated with sustainable woodland and forestry management and upland restoration, is £12M. When considered with the cost of other pressures, 35 of those water bodies have been calculated to be cost beneficial to improve.

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 river banks, 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.

4.1.6 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 measure review
- Multi-Sector demands project for water saving measures

- Waterwise work on reducing water consumption

An accurate economic appraisal of changes to natural flow and level of water has not been possible.

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

4.1.7 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

An accurate economic appraisal of managing INNS has not been possible.

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,

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 Western Wales RBD

Partnership working

Lead	Action
Afonydd Cymru	AC DC: The Nutrient and Soil Management project, West Wales. Working directly with farmers across a number of catchments in West Wales, this project takes a hands-on approach to improving water quality by offering advice and financial support to farmers. This joint project with Afonydd Cymru (Welsh Rivers Trust) and DCWW has been modelled on the successful work by the farm team of the Wye and Usk Foundation, bringing together pragmatic and cost-effective actions to achieve improvements to water quality. Projects designed to protect the wildlife in many of Wales' most treasured rivers have been given the green light, thanks to a Welsh Government cash injection of more than £1.1million.
Clwyd, Conwy and Gwynedd Rivers Trust	Improving habitat for salmon and sea trout in Denbighshire - In 2003, a fish pass was built at Bontuchel on the river Clywedog, a major spawning tributary of the River Clwyd and it was thought that this would open up 15km of new spawning habitat for fish. It turned out that the fish pass had only really opened up 8km of spawning habitat with a large percentage of fish unable to get past another partial barrier upstream of Bontuchel at Cyffylliog. The Clwyd, Conwy and Gwynedd Rivers Trust approached NRW to see if any work could be undertaken to create more access by removing this partial barrier. This work was completed to create steps and pools so fish can recolonise this tributary. The completed project allows salmon and sea trout to reach an additional 7km of spawning area.
Farming Connect	The WLMF Subgroup on Agricultural Pollution identified 64 water bodies as a priority regarding diffuse agricultural inputs, led by Farming Connect; actions included targeted water body events and pollution prevention farm visits.

Lead	Action
	Some of these are part of ongoing NRW partnership projects such as Taclo'r Tywi, Sustainable farming - Living Levels project and the Lower Clwyd Project.
Snowdonia National Park Authority	This project (Welsh Government Sustainable Management Scheme funded) on the Afon Eden included on-farm interventions to improve water quality and protect freshwater pearl mussel. It also included a feasibility study on potential morphological amendments to Crawcwellt weir, which relates to NRW HMWB mitigation measures investigation on the Eden – upper.
National Trust	NRW is working with the National Trust on a major project that aims to benefit the entire catchment of the river Conwy – from the uplands of the Migneint to the confluence in Betws-y-Coed. By securing better land and water management in the Upper Conwy, we will give a welcome boost to the environment and wildlife, local communities and local economy. One focus for the project is the Afon Machno, which is being restored to a more natural, meandering state. By slowing flows and making space for water, we are reconnecting the river with its banks, restoring seasonally wet flower-rich meadows and alleviating flood risk downstream.
NRW	The Taclo'r Tywi initiative was established to engage with stakeholders in the Tywi Valley, it aims to develop practical sustainable solutions for the catchment that will support agriculture, forestry, conservation, tourism and recreation. One of the challenges for Taclo'r Tywi is declining water quality and biodiversity. Invasive plants have the potential to negatively affect biodiversity, Himalayan Balsam is a concern on the River Tywi because the seeds from the plants are easily dispersed downstream. Plants quickly colonise the riverbanks excluding other vegetation and in the winter months die back leaving large areas of the riverbanks exposed to erosion and collapse, negatively effecting water quality. NRW is working with a number of stakeholders including the Carmarthen Fisherman's Federation (CFF) and Welsh Wildlife Trust to share information and best practice on Himalayan Balsam control. Actions include mapping the main river and some of the tributaries using the Plant Tracker app to record distribution, a local scout group (Merlin Explorer Scouts) helping CFF to complete an eight-mile mapping exercise of the River Sawdde and pulling

Lead	Action
	and strimming of Himalayan Balsam on the main river and the Llandovery Bran.
Royal Society for the Protection of Birds (RSPB)	Summit to Sea Partnership – Partnership project exploring innovative approaches to working for nature at the landscape-scale. The Summit to Sea project is working in an area of Mid-Wales, from the rugged uplands of the Cambrian Mountains, down through wooded valleys to the Dyfi Estuary and out into the marine-protected areas of Cardigan Bay. The RSPB are engaged in landscape scale projects at a number of sites across Wales, these include the Gwent Levels, the Ellenydd-Mallaen, the Meirionnydd Oak Woods and the North Wales Moors. These areas have been designated priority landscapes for the RSPB who welcome the opportunity to engage with measures aimed at ensuring European sites achieve Favorable Conservation Status and improving the water environment within these areas. Nature Based Solutions Projects: work is currently underway to assess and compare the ecosystem service benefits of different woodland habitats. This work is focused on three catchments in Wales (The Dee, the Elan Valley Catchments and catchments affecting Bridgend).

Projects

Small changes for big improvements in water quality in the Clwyd catchment

NRW is continuing to work with farmers along the River Clwyd to reduce pollution from agriculture, which can have a detrimental impact on Rhyl beach Bathing Water Protected Area. As part of the project NRW staff engaged with around 200 farmers in the Clwyd area, providing advice on how best to protect the river from agricultural pollution.

Measures included making sure slurry is managed and spread carefully, avoiding run-off from compacted soil, preventing stock from entering streams, controlling run-off from dairy tracks and ensuring clean and dirty water are kept separate.

As well as advice, NRW officers directed some farmers towards Welsh Government grants if they needed specific help to improve pollution prevention, as well as working with a number of farmers on fencing of watercourses to prevent cattle access. This work has continued working closely with the North Wales Rivers Trust.

Pelenna

On the River Pelenna in the Afan catchment, 8 obstructions to fish passage were identified, ranging from forestry culverts to perched bridge ramps. Fish easement scopes have been developed, and whilst some remedial actions have been identified for third parties to implement in order to deal with the obstructions, project funding will be required to address the remainder. A river restoration plan has also been completed for this catchment.

Burry Pill catchment

Surveys of the Burry Pill catchment on North Gower have identified a number of areas where riparian habitat could be enhanced to contribute to better ecological quality in the water body. Fish and an eel passes have been installed in recent years within the water body which directly seek to address the specific failing element for the Burry Pill. Additional funding was secured in 2020 to enable implementation of measures to reduce sedimentation and nutrient inputs in the upper catchment caused by stock access to water courses. The work will also include an amount of habitat enhancement and some pond restoration to compliment nearby work undertaken by Amphibian and Reptile Conservation. When fully implemented the project should contribute to improvements in the ecological health and status of both the Burry Pill and the Carmarthen Bay & Estuaries SAC into which it flows.

Improving natural salmonid production

There are programmes of work on the Seiont and Mawddach developed since the hatchery closures and salmon and sea trout stocking was stopped. These “alternative mitigation” funded programmes generate additional natural salmon and sea trout production. Work included:

- improving in-river spawning habitat (Pen Llyn, Seiont)
- pre-barrage easement to improve fish migration on the Afon Wen, a tributary of the Afon Mawddach
- installation of gravel traps to create spawning and improvements in in-river habitat through introducing boulders and woody debris (Wnion)
- Wnion and Mawddach projects used local timber sourced via forestry colleagues and NRW worked in partnership with the Mawddach Trust

Advice and guidance for farmers

As well as statutory work, such as cross compliance and NVZ farm visits, NRW works with farmers to provide advice and guidance. In 2016 we offered farmers free soil testing and nutrient management planning in or around the Llŷn Fens, part of the Anglesey and Llŷn Fens SAC and in the failing Llŷn & Eryri groundwater body. This followed on from work in 2015 when we had a similar project covering both the Anglesey & Llŷn fens.

Eight farms in the area (not all necessarily within the SAC) signed up to the free soil testing and nutrient management planning and twenty four silage fields were sampled by Farming and Wildlife Advisory Group (FWAG) Cymru during November and December 2016

covering an area of 95 hectares. A field specific nutrient management plan was also provided based on the soil analysis results, previous nitrogen applications and future cuts of silage.

The results indicated that most fields were receiving higher than recommended nitrogen and phosphorus applications, and that reducing these applications could result in annual fertiliser cost savings ranging from £13 to £120 per field.

The Metal (Non-Coal) Mine Programme - Research Development and Innovation

This is a collaboration between NRW and The Coal Authority. Completed work includes prioritisation of metal mines and development of a programme of work for remediation in water bodies that fail chemical and ecological quality standards. Progress has been made in a number of catchments including the Teifi, Rheidol, Ystwyth, Tywi, Dyfi and Conwy, through a mixture of feasibility studies, completing design stages and implementing remedial measures for surface water management, mine water treatment and safety. Current Research Development and Innovation includes Dispersed Alkaline Substrate pilot trials, these involve implementing the first UK passive trials using magnesium oxide and barium carbonate within the treatment process.

Pembrokeshire

Working within the Afonydd Cleddau catchments including the Afonydd Cleddau SAC in response to the classification status and to also compliment other work being undertaken in the area, the approach has also had beneficial impacts on the Pembrokeshire Marine SAC. It includes:

- Completing work on eradicating and managing INNS.
- Dairy farm project - NRW is currently delivering a work programme undertaking agricultural pollution prevention visits to dairy farms in Wales. The aim is to reduce the number, frequency, severity of agricultural pollution incidents and improve classification status. The project is also helping farmers achieve regulatory compliance and follow best practice. The ambition is to visit all Welsh dairy farms.
- Building Resilience in the Catchments (BRICs) Project - Working with partners, this landscape scale project has assisted farmers in three sub-catchments to improve water, nutrient and habitat management on a farm scale. This is being achieved through farm resilience planning and the implementation of practical measures, e.g. targeted soil conductivity scanning, grid soil sampling etc.

Loughor Catchment

Passive sampling has been completed on the Afon Lliw and data is being analysed. The sampling programme was designed to help identify the source of the polycyclic aromatic hydrocarbons (PAH) failure on the Lliw.

Fish Passage Improvement

The Sustainable Fisheries Programme has delivered over 60 fisheries improvements (including habitat improvements and fish easements) across Western Wales from 2015 –

2020. Fish passage improvements have been carried out within the Tywi, Clwyd, Mawddach & Seiont catchments.

Solva Natural Flood Management Project

Two main phases of work haven been completed to install leaky dams and river restoration. This work will increase the ability of the river to flow onto its floodplain, whilst providing environmental benefits such as habitat restoration for wildlife and plants.

Welsh Government Sustainable Management Scheme (SMS) funding (2014-2020) aimed to support 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 also supports and facilitates 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.

This funding brings wider benefits including for water, relevant projects for the Western Wales RBD include:

- **Tir a Môr Llŷn – Land and Sea**

  This collaborative project led by the Llŷn Landscape Partnership brings together statutory, environmental, economic and social groups. The project is centred on addressing the challenges impacting on the natural resources in the area.

- **Cynllun Dalgylch Yr Afon Eden Catchment Project**

  A farmer led project centred on the improving ecological quality of the Afon Eden SAC and its tributaries at catchment scale by planting and managing native deciduous trees, further benefits include improved natural habitats, erosion prevention, a reduction of greenhouse gases and less fossil fuel use.

- **Powys Moorland Partnership**

  A landscape scale project to encourage moorland restoration through bottom up collaborative action driven by communities living and working on and around the moors.

- **Realising the Natural Capital of Welsh Peatlands**

  A project, taking collaborative action with stakeholders, including communities, to transform and improve peatlands across Wales. Improvements include ecological stability and long-term sustainable management of peatlands.

Case Studies

Case study 1: Restoration of natural processes, Afon Merin, Ceredigion

The Afon Merin is one of the principal tributaries of the Rheidol system flowing from its upland Site of Special Scientific Interest (SSSI) catchment, through NRW managed Welsh Government estate Myherin woodland near Devil's Bridge, Aberystwyth to the Rheidol

Valley. An opportunity was identified to deliver river restoration and habitat improvements on approximately 3km of meandering river corridor in the upper reaches of the river. The site is upstream of a number of natural barriers to migratory salmonids and supports native brown trout populations. It provided landscape scale intervention opportunities to kickstart natural processes to benefit biodiversity, water quality, flow levels, natural flood management, fisheries and well-being.

The project commenced in early 2018 with felling of conifer to waste within the flood plain area and some of the more readily accessible timber was removed. Phase 2 of the project looks at ditch blocking and instream structures to re-link the river to the floodplain. NRW will use this project as an illustration of low cost, low technology river restoration both internally and with external partners. The project was one of the finalists in the 2020 UK River Prize.

Case Study 2: Restoration work shows encouraging results

Restoration work completed by NRW aimed at protecting Wales's rarest habitat, lowland raised bogs, is seeing positive results.

Work has been ongoing since September 2020 to restore two raised bog sites in Ceredigion by creating over 1.8 km of peat bunds. The work aims to restore more natural water levels at Cors Fochno and Cors Caron National Nature Reserves, two of the best and least damaged raised bogs remaining in the UK. The sites are internationally important and are classed as Special Areas of Conservation (SAC).

Restoring natural water levels on raised bogs will ensure they stay wetter for longer, helping to create areas where important sphagnum (bog moss) can establish and thrive. A diversity of sphagnum types is a sign of a healthy bog, and the peat it creates naturally absorbs and stores tonnes of carbon from the atmosphere, helping in the fight against climate change.

By creating these bunds it is estimated that on both sites, almost 85 hectares (210 acres) of bog habitat will benefit and be returned to good condition helping to create new peat and lock in more carbon.

In the UK a staggering 94% of lowland raised bogs have been lost, the LIFE Welsh raised Bogs Project aims to restore seven of the very best examples in Wales.

Case Study 3: Weir removal set to bring multiple benefits to West Wales river

A joint project between Natural Resources Wales and the West Wales Rivers Trust (WWRT) to open the upper reaches of the Eastern Cleddau at Vicar's Mill to migratory fish has been completed. The removal of the weir is the culmination of more than six years of planning by NRW and WWRT and will play a key role in improving the health of the River Cleddau and its fish population.

There has been a weir at Vicar's Mill since the 1800s when waterpower was used for milling. The fish pass tended to block with debris, preventing access to the upper reaches for a variety of migratory fish species. The river is a Special Area of Conservation and a number of migratory fish species, such as brook and river lamprey, are features of the designation. Removal of the structure will improve access to more than 20km of upstream fish habitat and restore the natural river geomorphology. We hope that all migratory fish

species will be able to access the whole Eastern Cleddau catchment to spawn and complete their various life cycles. NRW will continue to work with partners to explore more river restoration opportunities like this, or working with natural processes through the South West Wales Area Statement work.

Case Study 4: Small Changes for a cleaner river

Work to improve water quality along the Afon Wygyr, Anglesey, that affects the Bathing Water of a popular seaside village, took a major step forward in August 2019. NRW worked with local farmers to reduce pollution from agriculture which affects Cemaes Bay. Starting with seven farms, 7km of the river was fenced off, with troughs installed to provide alternative drinking water for cattle. Overall, access to the river will be restricted for up to 700 cattle; less cattle in the river will mean less disturbance to the riverbed and riverbanks which is good news for wildlife. The work was part of a wider programme of pollution prevention measures for Cemaes Bay, done in partnership with the local community, the Rivers Trust, DCWW and Anglesey County Council.

Case Study 5: Clear Streams, Swansea

This project aimed at making sure that Swansea's waters are clean, healthy, free from pollution and can be enjoyed by everyone. Whilst the water quality of the rivers in Swansea are improving, many of these waters are failing the standards set under WFD Regulations 2017. The project was initiated several years ago and a variety of organisations are involved: NRW, City & County of Swansea, Keep Wales Tidy, Groundwork Wales, Swansea Environmental Forum, Schools, Swansea University and business organisations. It works by involving people, communities and organisations in a range of activities.

A different approach was used in a highly urbanised area in Swansea. Rain planters were used to demonstrate that water is a resource and not a waste. The work has seen Clear Streams engage with hard to reach communities. The project continues and we hope to involve more communities in this work to raise awareness of how all our activities place enormous pressure on water quality and quantity.

Case study 6: Upper Conwy Catchment Project

The Upper Conwy Partnership Project between NRW and the National Trust began in 2015. The partnership is working with local communities, tenants and landowners to take action to improve sensitive land and water management in the upper Conwy, benefitting people and wildlife across the wider catchment.

The partnership driving the project forward has grown from the National Trust and NRW working with a few key communities to include Conwy County Borough Council, Foelas Estate, Bangor University, Snowdonia National Park Authority and Fferm Ifan. Covid has got in the way of a broader face-to-face engagement with communities but work continues with landholders and tenants and those who have attended events in the past continue to receive newsletters.

One of the main benefits of restoring natural habitats is the increase we see in their ability to store and slow the flow of water. In addition to contributing to flood management, the

benefits of restoring rivers and water quality includes habitat enhancement and improved climate change resilience for Llanrwst and the lower Conwy valley communities.

Since 2015 the project has reconnected sections of Afon Machno and Nant y Gwryd with their natural floodplains by reprofiling the riverbanks and allowing the rivers to meander again. More hedges and thousands of trees are being planted to slow overland flow of water, improve soil structure and create wildlife corridors to connect isolated habitats, on the back of peat restoration works previously and ongoing.

These works are already starting to see habitat improvements for spawning fish and wildlife.

The partnership focussed on the Nant y Gwryd: river restoration and the Caletwr.

For more information: www.nationaltrust.org.uk/projects/working-towards-a-cleaner-healthier-catchment

Case study 7: Green Engineering Project helps restore river

The Aeron is an important spawning ground for sea trout, salmon and brown trout. NRW worked with Ceredigion Council and the landowner to find a natural solution to erosion problems caused by a narrow bridge, built in the 1950s, in Llangeitho, Ceredigion. The bridge “pinched” the river, forcing it to go faster through the narrow space under the bridge and slowing the water down upstream. This caused sediment to drop, which, over time, created a gravel island.

Some trees have been placed on the riverbank to prevent further erosion and two trees were partly inserted into the bank to divert the flow. This has created a natural barrier which protects the riverbank and diverts the main river flow onto the gravel island. This slowly reduces the gravel bed, creating pools for fish and leaving fine gravel which the fish need to spawn.

Life projects

4 Rivers for LIFE (LIFE20 NAT/UK/000100)

A large £9.1 million NRW led river restoration project across four river SAC rivers; the Teifi, Tywi, Cleddau and the Usk (Severn RBD) partly funded through LIFE funding with contributions from Welsh Government, DCWW, Brecon Beacons National Park Authority, the River Restoration Centre and the Woodland Trust. The project began in 2021 and will run for five years, carrying out a range of measures to address diffuse pollution across the four river catchments as well as increasing the resilience of the rivers by restoring natural processes and habitat features. These actions will contribute to improving the condition of the river habitats as well as protected species including salmon, sea and river lamprey, twaite and allis shad and freshwater pearl mussel.

LIFEquaking bogs (LIFE19/NAT/UK/000888)

Starting in January 2021 and running to December 2025 this NRW lead project with support from Pembrokeshire Coast National Park Authority and Snowdonia National Park Authority and National Trust at a cost of £4.6 million covers seven quaking bog SACs:

- Crymlyn Bog
- Corsydd Eifionydd
- Rhos Goch (Severn RBD)
- Northwest Pembs Commons
- Gweunydd Blaencledda
- Cors Caron

Sands of LIFE project (LIFE17 NAT/UK/000023)

Running between September 2018 and December 2022 the Sands of LIFE project aims to revitalise sand dunes across Wales by recreating natural movement in the dunes and rejuvenating habitats. The £4 million project originally funded via the LIFE programme led by NRW and part funded by Welsh Government, will restore over 2400 hectares of sand dunes at 10 separate sites, within 4 Special Areas of Conservation all within the Western Wales RBD. The project aims to bring the dunes into favourable conservation status by remobilising some, re-introducing grazing, removing scrub and invasive species and developing a comprehensive communication programme.

New Welsh Raised Bogs project (LIFE16 NAT/UK/000646)

In October 2017 NRW, with support from Welsh Government and Snowdonia National Park was awarded £4 million towards a project originally funded via the LIFE programme to restore lowland raised bogs across seven sites in the Western Wales RBD. The 4-year pioneering and ambitious project aimed to restore seven of the very best examples of raised bogs in Wales. Over 900 hectares will be restored to a better condition, working towards meeting Protected Area objectives for 7 Special Areas of Conservation. This represents 50% of this wetland habitat in Wales and 5% in the UK.

Pearls in Peril (LIFE/NAT/000383: PIP GB)

This LIFE funded project led by Scottish Natural Heritage covered 21 rivers across the UK including the Afon Eden - Cors Goch Trawsfynydd SAC in Wales. The project ran from 2012 to March 2017 costing £3.5 million. Pearls in Peril has restored 2.4km of in-stream habitat including gravel seeding to create fish spawning habitat and the placement of boulders from historic bank protection to re-instate riverbed substrate and create habitat for freshwater mussels. To address diffuse pollution from forestry activities, the project removed 2ha of conifer regeneration, blocked 12km of forestry drains, fenced 4.5km to prevent livestock access and constructed 11 settlement ponds. This work is restoring 54ha of the Brynteg forestry block to wet woodland and blanket bog and is reducing the levels of diffuse pollution entering the Afon Eden.